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Corrigenda

Abs. 447, line 17 : for *P. robustia* read *P. robusta*

Abs. 487, line 13 : for *Tussilago faxfara* read *Tussilago farfara*

Abs. 548, line 7 : for 10*u* read 10μ

Abs. 566, line 35 : for *A. hypogea* read *A. hypogaea*

Abs. 595, line 3 : for 100-400*u* read 100-400μ

Abs. 635, line 6 : for *Arachis hypogea* read *Arachis hypogaea*

Abs. 876, line 2 of title : for root crop read root rot

Abs. 884, line 5 of title : for Doroth H. Jameson, read Dorothy H. Jameson

Abs. 1137, line 1 : for *Phytophtora* read *Phytophthora*

Abs. 1144, line 2 : for casual read causal

Abs. 1161, lines 7, 17 and 27 : for *G. psoraliodes* read *C. psoraliodes*

Abs. 1176, line 27 : for *Arachis hypogea* read *Arachis hypogaea*

Abs. 1195, line 14 : for *Sec.* read *Soc.*

Abs. 1263, line 3 : for garicola read agricola

Abs. 1310, line 27 : for *Goaboreum* read *G. arboreum*

Abs. 1313, line 18 : for *Empoasea* read *Empoasca*
line 19 : for *Bemesia* read *Bemisia*

Abs. 1314, lines 11, 18 and 24 : for *A. hypogea* read *A. hypogaea*

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FIELD CROP ABSTRACTS

LAND UTILIZATION AND MANAGEMENT

LAND OF BRITAIN (THE). Parts 24–25. **Peeblesshire : Selkirkshire.** By *D. L. Linton* and *Catherine P. Snodgrass.* **1**

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LAND OF BRITAIN (THE). Part 29. **Aberdeenshire.** By *W. G. Ogg* and *A. Muir.* **5**

LAND OF BRITAIN (THE). Part 30. **Fife with Kinross and Clackmannan.** By *A. C. O'Dell, Catherine P. Snodgrass,* and *L. Dudley Stamp.* 28×22. pp. 199. 10s. **6**

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LAND OF BRITAIN (THE). Part 62. **Warwickshire.** By *A. W. McPherson.* 28×22. pp. 189. 12s. 6d. **9**

London : Published for the Land Utilization Survey, London School of Economics, Houghton Street, W.C.2, by Geographical Publications, Ltd. 1946. See also *Herb. Abstr.* 17. Abs. 863.

JOHNSTON, D. P. **Farm production recording in Hampshire.** Report for 1942–45. *J. Minist. Agric.* **53.** 402–410. 1946. **10**

The Farm Production Recording Scheme was started during the early years of the war. The work has involved grouping of farms in relation to soil type and determinations of (1) a productivity index, (2) distribution of output, (3) milk yields, (4) feed areas utilized for live stock, (5) crop yields, and (6) utilization of labour and mechanical power. An output and yield statement giving the data for a number of farms in a particular group is supplied.—M. H.

LONDON. House of Commons Reports. Cmd. 6938. **Wales and Monmouthshire.** A summary of Government action, 1st August, 1945, to 31st July, 1946. 1946. 78. **11**

The section on agriculture contains reference to the organizations concerned in Wales, and to the type of agricultural production in Wales, especially live stock.—R. O. W.

WASHINGTON. Food and Agriculture Organization of the United Nations. **Report of the FAO mission for Greece.** 1947. 27 × 21. pp. 199. **12**

The recommendations on agricultural research deal with the concentration of research at two Agricultural Experiment Stations (at Thessalonica and Athens), the development of crop husbandry, seed production of wheat, maize, cotton, and other crops, methods of planting, soil conservation in areas where steep hillsides are farmed or overgrazed by sheep and goats, the extension of forage crop research to include "grasses suitable for permanent pasture areas," and determination of methods of "breeding, feeding, and management of live stock best suited to Greek agricultural conditions, having in mind the most profitable use of the future irrigated areas of Greece as well as of the present extensive grazing areas." There is a special appendix by Dr. Norman Wright on live stock and live stock products.—R. O. W.

CARSON, J. B. **Some experiments in native agriculture in the Elgeyo-Marakwet district of Kenya.** *E. Afr. Agric. J.* **13.** 34–36. 1947. [Dist. Commissioner, Elgeyo-Marakwet, Kenya] **13**

The district is divided into three zones : the high country (7500 ft. to 9000 ft.), the escarpment, much of which is sheer cliff (5000 ft. to 6500 ft.), and the valley (3500 ft. to 4000 ft.). In general, the natives live on the escarpment, herd their cattle in the high country, and keep their goats in the valley. The problem is that of inducing the population to leave the escarpment and to encourage them both to cultivate and live in either of the other two zones. The people are naturally lazy, therefore a crop that is easy to look after and harvest can be more easily popularized than a difficult one. They are conservative ; therefore a better variety of a well-known crop, such as "Dobbs" sorghum, has a stronger appeal than something strange. Always bearing in mind that it is easier to get the natives to plant something they like, or at least tolerate, than something they heartily detest, efforts have been concentrated on a few easily defined objectives rather than on a large number of detailed schemes. The main lines of work have been experiments with new crops, seed-bulking, and propaganda to introduce a crop rotation with special emphasis on legumes.—G. M. H.

MATHESON, A. **Native farming methods are changing.** *Mod. Fmg* **3.** 9–11. 1947. **14**

The Union Government has undertaken a vast policy of land reclamation in the native areas. It is an ambitious attempt to save the natives from the wasteful and disastrous policy of their own traditional agriculture. The African peasant is to be persuaded to give up his old haphazard method of farming and to value the soil which bears his maize and kaffir corn. The agricultural officers also have the task of persuading the natives that a few good cattle are better than many scraggy, ill-fed beasts. The State's policy of "farming the native's land for him" will entail much work, patience, a large staff, much money and the full co-operation of the rural native. The main hope is that it should pay great dividends in restoring the value of the soil in the reserves, increase greatly the country's food potential and end periodic hunger cycles. Eventually it will have taught the native population how to farm in a settled and stabilized community.—G. M. H.

SCOTT, R. C. **The marginal lands of South Australia.** *J. Dept. Agric. S. Aust.* **50.** 241–245. 1946. **15**

A report is given on the work of the Marginal Lands Committee ; marginal areas are defined : "Areas which have been subdivided into blocks intended principally for wheat growing and which have been utilized mainly for that purpose, but owing to the combination of an inadequate rainfall and unsuitable land have proved to be unsatisfactory for wheat production as a major operation." The total area of such country in South Australia is nearly 7 million acres, but almost 5 million acres were found to be in holdings large enough to permit mixed farming with live stock as the main source of revenue. On the remaining area there are 1276 settlers, whereas there is sufficient land for only 659. By gradual purchase and amalgamation of holdings, farms of sufficient size will be obtained.—R. O. W.

WOOD, I. D. **The place of the agricultural engineer in the Missouri River development.** *Agric. Engng.* **27.** 562–564. 1946. [Soil Conservation Service, U. S. Dept. Agric.] **16**

Water for irrigation will be provided for 4 million acres of new land, and supplemental water to half a million acres in addition, in an area where production is highly variable due to climatic conditions. The shift from dry land farming to irrigation will introduce many new and difficult problems. There has been a tendency for farms to grow larger to achieve a more efficient dry land unit operated with mechanical power. The coming of abundant water will reverse this process, and entail modification of farm organization, crop rotations and ownership and tenure arrangements. A staple live stock economy will become possible based on alfalfa, maize, cereals, and irrigated pasture. The cost of the water will be an important factor in such a development.—R. O. W.

KENTUCKY AGRICULTURAL EXPERIMENT STATION. Bull. 486. **Value and use of tobacco stalks in farm practice.** By *M. E. Weeks* and *P. E. Karraker.* 1946. pp. 12. **17**

The value of tobacco stalks as a source of fertilizer nutrients, especially nitrogen and potassium, is not fully appreciated and much wastage occurs. The stalks may be spread directly on the land in winter on pasture, meadow, or cereal land, or may be used as bedding under cattle or horses.—R. O. W.

FLORIDA. Department of Conservation. *Florida Geological Survey.* Geolog. Bull. No. 30. **The peat deposits of Florida. Their occurrence, development, and uses.** By *John H. Davis.* 23 × 16. pp. 260. 1946. **18**

The present work is written both from the agricultural and geological angle. The nature, origin, physical properties, chemical composition, natural vegetation, and geology of these peatlands are discussed.

Florida has the third largest amount of peat in the United States. Peat is therefore a great natural resource of this State. Those deposits which have been drained are used for production of sugar cane, winter vegetables, and other crops. The uses of peat as fertilizer and its industrial uses for fuel and power and as a raw material for plastics and waxes are outlined.—D. B.

FARMING SYSTEMS

MARTIN, W. S. **Soil fertility.** *Emp. Cott. Gr. Rev.* **24.** 9–17. 1947. [Dept. Agric. Uganda] **19**

There is discussion of the development of farming systems in Britain, of agricultural systems in new areas, and of the grass rotation in its effect on soil structure.—M. H.

YORK, ASKHAM BRYAN, National Institute of Agricultural Engineering. **Farm Case Study No. 3. A study of a 200-acre farm on warp land south of the Yorkshire Ouse in relation to its use of machinery.** By *J. W. Y. Higgs*, and *M. M. Sandilands.* 1946. 20. **20**

The pre-war system was essentially arable with a common rotation of potatoes–wheat–oats–seeds, but recently parts of the seeds break has become sugar beet or picking peas. Incidence of eelworm has made it necessary to extend the interval between potato crops. The farm studied is in the West Riding on very fertile land. Of the 204 acres in the farm, only 14 acres are in permanent grass. Some bullocks are kept for manure, remainder of stock, apart from horses, for domestic purposes. The degree to which machinery and power are used is described.—R. O. W.

BRISTOL UNIVERSITY, Department of Economics (Agricultural Economics). **Wartime farming. One hundred farms, 1939-45.** By *C. V. Dawe.* 1946. pp. 132. **21**

An account of acreage changes, production, yields and sales of corn crops, cereals, sugar beet, potatoes, and hay, and of milk production in relation to pastures, root, and fodder crops. —P. M.

JONES, T. G. **The possibilities of introducing the growing of vegetables into certain systems of Welsh agriculture.** 1947. pp. 11. [Mimeographed.] [Dept. Agric. Econ. Univ. Coll., Aberystwyth] **22**

The war years saw an increase in the growing of vegetables on mixed and dairy farms. Assuming that the conditions will largely obtain, a preliminary survey is made of sixteen farms in Carmarthenshire and parts of Glamorgan and Pembroke. Based on results taken for 1944–45 and 1945–46, an attempt is made to show that vegetable growing can be fitted into the average set-up of the dairy farm with profitable results. It is intended as a preliminary to further study.—P. M.

LITTON, J. G. **A farmer's viewpoint.** *Agric. Ireland.* **4.** 77–80 and 100–103. 1947. [Kilternan] **23**

(1) A farmer's views on good and bad farming systems, with particular reference to wheat production (dependent on plenty of live stock and a sound rotation), root crops, cereal-legume silage, and the importance of legumes in silage.

(2) Discussing dairy production and the feeding of the "present mediocre animals," it is stated that the cost of the food must be less than the price obtained for the milk, that "we are all agreed that grass is the cheapest and best food for dairy cows," but that the problems of increased output from grassland and the conservation of grass for winter use have scarcely been touched on in Ireland.—R. O. W.

VERVELDE, G. J. Het doel van grondbewerking. Literatuur-overzicht. [**The aim of cultivation. Review of the literature.**] *Landbouwk. Tijdschr.* **59.** 78–80. 1947. **24**

The review leads to the necessity for visualizing more clearly the actual objects of tillage and cultivation. The prevalent opinion that yield increases with intensity of cultivation is not proved, and a similarly common theory that root crops such as beet cannot be sufficiently hoed is disproved. While thorough tillage before sowing and hoeing or cultivation during the growth period are indispensable for weed control, too much cultivation can reduce production.—G. M. R.

WATSON, S. J. **Post-war conditions in the Netherlands.** *Scot. J. Agric.* **26.** 143–147. 1947. [Edinburgh Univ.] **25**

Measures which have been adopted to restore areas devastated by Allied and German forces during the war are recorded, and the farming system of Friesland is described, with special reference to pasture management.—M. H.

ADLER, H. E. **Turkistan in transition.** *Geogr. J.* **107.** 230–235. 1946. **26**

Since the Bolševik revolution, Turkistan has been divided into the five republics of the Uzbek, Turkmen, Tadžik, Kirgiz, and Kazah peoples. The western and greater part of this region is lowland desert, the Kara Kum and Kizil Kum together forming one of the great arid areas of the world. Desiccation in both deserts is on the increase, and the possibilities of exploitation were shrinking until the political change and impact of modern science brought about an abrupt transformation.

The practice of flood farming is an age-old economy, but the technique is slow and laborious. In recent years the change in technique has been phenomenal. The chief commercial crop is cotton, but drought-resistant crops such as sesame and *Apocynum sibiricum* (the raw material for hemp) are favoured. All regions of irrigation farming are affected by shifting sand, and measures to control this are being taken. Research centres are noted.—M. H.

BRACKEN, A. F. **Pattern of dry-farming practices in intermountain area set by work done at Nephi Dry Land Station.** *Fm Home Sci.* **7.** 5 and 16. 1946. [Now Agric. Adviser to Govt. of Syria] **27**

A popular review of work at this Station in Utah, including studies of crop varieties, rotations, rates, and times of seeding and other research conducted over a 43-year period.—R. O. W.

ANHOURY, J. Les répercussions de la guerre sur l'agriculture égyptienne. [**Repercussions of the war on Egyptian agriculture.**] *Rev. Bot. appl.* **27.** 5–14. 1947. **28**

State intervention in agricultural affairs has taken the form of regulation of the rotation, rationing, and control of chemical fertilizers, and requisitioning of cereals at fixed prices. The change in the rotation practice was to increase the area of cereals and reduce that of cotton which, in normal times, occupied half the cultivated area. The change has resulted in impoverishment of the soil and loss of revenue from cotton. Rice acreage was extended by irrigation.

The shortage of nitrates has been severely felt. The use of fertilizers was permitted only for cereals, legumes, and sugar cane, but not for cotton, though some farmers diverted their use to cotton cultivation. In spite of the reduction in the cotton area and hence the revenue obtained from cotton, the marketing position of agricultural produce was such that all except the salaried classes improved their financial position.—D. B.

HARTLEY, C. W. S. **Experiments on the growing of off-season crops on padi land in Province Wellesley.** *Malay agric. J.* **30.** 114–122. 1947. [Agric. Officer, Penang and P. Wellesley] **29**

Experiments at Bukit Merah Padi Test Station have shown that the cultivation of the soil in the off-season leads, in the first few years, to increased padi yields. On this type of padi soil, it is found that satisfactory off-season crops can be obtained from groundnuts by application of lime, and from sweet potatoes, ladies' fingers, brinjals, and cowpeas by application of cattle or buffalo manure. Little or no crop can be expected unless such manuring is undertaken. Nevertheless, it appears that, in the first few years, it is the cultivation for off-season crops and not the manuring which produces the subsequent increased padi yield, though it is possible that liming for groundnuts may also lead to an increase. It is essential, however, if successful off-season crops are to be grown, and this applies particularly to groundnuts, that it should be possible to run off rapidly the surplus water from the March to May rains.—G. M. H.

WILKIE, D. R. **A Marlborough mixed farm.** *N.Z. J. Agric.* **73.** 319–325. 1946. [Blenheim] **30**

The arable land in this area is relatively limited, consisting of: (1) the Wairau Plain, where first-class to light land is to be found, the poorer country being at the top of the valley; (2) the Awatere Plain, once famed for the excellence of its oaten chaff, and comprising medium to good land; (3) Ward, with a small pocket of good arable land; (4) the Kaikoura Plain, which has an area of heavy country with light land adjoining; and (5) the Sounds County, mostly hilly, with small areas of ploughable land, parts of excellent sheep country, but other areas are reverting to second growth.

The diversity of soil type in the area has bearing on the diversification of production, which is a feature of the farming in this district. Aspects discussed include the role of stock keeping as a side-line to cropping, the importance of fertilizers, returns from pastures, cropping with peas, wheat, barley, and oats, and clover seed production.—M. H.

HOLMES, G. A. **Farming in New Zealand. I. Migration and land settlement.** *Agric. Ireland.* **4.** 87–89 and 103–104. 1947. [New Zealand House, Strand, London] **31**

The first two parts in this series deal with migration and land settlement, and geographical, soil, and climatic conditions, in so far as they interest Irish farmers. Subsequent articles will deal with the dairy industry and methods used in grassland and herd management.—R. O. W.

HOLMES, G. A. **Farming in New Zealand. IV. A dairy farm in the far south.** *Agric. Ireland.* **4.** 152–155. 1947. [New Zealand House, Strand, London] **32**

An account of the farming system and crop rotation practised on a dairy farm in Otago or Southland, where the crops grown in this cold district, in which it is not considered advisable to rely wholly on grass, are: swedes, turnips, narrow stem kale, potatoes, and oats (undersown with grass). For earlier articles in the series, see *Herb. Abstr.*—R. O. W.

SCOTT, R. H. **Farming in New Zealand. Cereal production.** *N.Z. J. Agric.* **74.** 353–367. 1947. [Christchurch] **33**

During the 1870 and 1880 decades, it appeared that large-scale wheat farming might form part of the farming pattern of Canterbury and portions of Otago. The rise and subsequent decline of the wheat farms is traced.

In 1893, the total number of Crown leases in Canterbury was 1020, by 1900 it had reached 2300, and by 1910 there were 3290. Several large properties, such as Cheviot in North Canterbury, and Rosewill and Waikakahi in South Canterbury, had been acquired by this time, the two last-named being subdivided into 336 holdings.

In the 70's, the farmer's revenue came mainly from wool, but on most parts of the plains of Canterbury and Otago it now comes from many sources—cereals, small seeds, fat lambs, and possibly a few cows, which bring a little side-line revenue to the farmer's wife. The farmer is a man of many parts ; he must know how to produce his cereal crops, grow small seeds, and produce supplementary fodder crops for winter feed for his sheep ; he must know something of animal husbandry, and is often a mechanic when his implements develop faults.—Extract.

BREAKWELL, E. J. **Some modern trends in the agriculture of the wheat belt.** *J. Dep. Agric. S. Aust.* **50.** 188–190. 1946. [Roseworthy Agric. Coll.] **34**

Reasons for, and advice concerning, the change from the wheat-fallow system to "clover-ley farming" in South Australia.—R. O. W.

GILHOOLY, P. J., & GOSSELIN, A. **Farm management study of Prince Edward Island potato farms.** *Econ. Annalist.* **17.** 38–40. 1947. **35**

Farm practices are standardized as to crop rotation, spraying material, commercial fertilizers, and varieties of potato. The five- or six-course rotation comprises potatoes after hay or pasture manured in the previous summer and ploughed in the autumn, followed by a grain crop with grass seed, two years in hay, and one or two years in pasture. Very few growers use green manure crops.—R. O. W.

CALL, L. E. **The crop industries of Kansas.** *Trans. Kans. Acad. Sci.* **47.** 1–6. 1944. [Received 1947.] [Kansas State Coll., Manhattan] **36**

A popular note on the crops which contribute to the Kansas production of 40 million tons of plant material, with special reference to wheat and other cereals including grain sorghums, flax, and soybeans, hay, including forage sorghums, cereal straw, cornstalks, and sorghum stover, and the many other lesser crops of the State.—R. O. W.

KENTUCKY AGRICULTURAL EXPERIMENT STATION. Bull. 480. **Feed for Kentucky live stock. Amounts of live stock and feed produced, and sources of purchased feed.** By *J. B. Roberts.* 1945. pp. 43. **37**

General live stock production predominates in the State, with cattle, sheep, horses, and mules forming two-thirds of the animal units. Self-sufficiency in feeding-stuffs has not been attained, but fortunately grains and commercial feeds needed to supplement home-grown crops are near at hand. A surplus of corn and feed grain is normally produced near the northern border of the State ; grains from the surplus areas of the Great Plains and Corn Belt tend to move eastward for milling-in-transit, and the by-products from the meat packing and oil-seed processing are concentrated in the cities of the Central United States. Most of the purchased commercial feeds thus come from Ohio, Illinois, Indiana, and Missouri.

Between 1939 and 1944, between 15 per cent and 20 per cent of the concentrates fed were purchased. These figures approximated to 5 per cent of the aggregate of feed nutrients produced by pasture, hay, and grain crops on all farms in the State, but its purchase required 15 per cent to 20 per cent of the cash income from the live stock industry as a whole.—P. M.

SAUER, E. L. **Long-time benefits of soil conservation.** *Illinois Fm Econ.* **145.** 533–536. 1947. [Univ. of Illinois Agric. Econ. Dept.] **38**

The adoption of a complete conservation plan usually reduces for one or more years the net income below what it would be from farming without conservation. Studies in different areas of the State show, however, that money spent on conservation is a sound investment, resulting in increased net income in from two to six years, depending on the extent of the farm's conservation needs. Returns from such investments afford a safe basis for credit for establishing the conservation program. Although the net income may be temporarily reduced, the productive value of the land increases immediately, protecting the financial position of the landowner until the long-time benefits of conservation accrue.—Author's summary.

Keesee, M. J. **Mississippi rolls out a green carpet.** *Soil Conserv.* **13.** 51–54. 1947. **39**

By changing from a production pattern that did not fit the natural capabilities of the soil to one which was closely adjusted to proper land use, an increase in the value of the farm of more than 50 dollars per acre has been achieved.

With the assistance of the Soil Conservation technicians, a farmer of the north-east Mississippi district brought about this change. Starting in 1938 with 44 acres of badly eroded land, the intention was for the production of milk and the growing of cotton. By 1943 the farm had been extended to 100 acres; in 1940 cotton and maize were the leading crops; by 1946 cotton had disappeared, and maize, silage, and oats and pasture crops were produced. Value of production rose from 1439 dollars in 1940 to 3209 dollars in 1946, and is expected to reach 3,735 dollars in 1948.

The example quoted is typical of the changes taking place under the encouragement of the North-East Mississippi Soil Conservation District.—P. M.

CROPS AND CROP PRODUCTION

Barker, A. S. **Supplies of some raw materials in British agriculture and their implications on soil fertility.** *J. Proc. Agric. Econ. Soc.* **7.** 218–235. 1947. **40**

Before the war, live stock production was responsible for the major part of the removals of N, P, K nutrients from British farms, but during the war (temporary?) precedence in this respect was taken by direct human food crops. In both periods the feeding of home-grown crops to live stock was probably responsible for an annual rate of nutrient losses exceeding those due to removals from farms in crops and stock products combined.

In addition to larger fertilizer inputs required for the expanded area of direct human food crops during the war, similar increases were essential for the attempt to sustain the pre-war cattle output, even with substantial reductions in the numbers of all other livestock. Nutrient materials for these purposes were not available during the war in quantity sufficient to allow phosphate and potash applications to grassland in any appreciable degree; permanent grass, therefore, was the most likely to deteriorate in "fertility," i.e. in potential productivity.

So long as relatively unlimited supplies of imported feeding-stuffs are available at prices permitting their profitable processing into live stock products, they may largely compensate for the N, P, K losses incurred in the analagous conversion of home-grown crops and the nutritive quality of the latter fodders is not necessarily a consideration of prime importance. The war has demonstrated that British farming has still a long way to go before it approaches a self-sufficient live stock economy on the pre-war scale, and, should that be desirable in the future, it implies the production of foods of higher nutritive values.

A post-war expansion of U.K. cattle and sheep production will demand the utmost economic exploitation of grass since it provides the cheapest mode of feeding. That implies a general improvement in past standards of management to secure from grass the maximum contribution to the total nutritive requirements of the stock, which, in turn, will depend on increased throughputs of the major soil nutrients more commensurate with removals than has been the common practice.—Author's summary.

Gilchrist, J. A. **Effect of yield on crop costs.** *Fm. Econ.* **13.** 8–9. 1947. [West Scotl. Agric. Coll.] **41**

Tabulated information refers to oats and turnips.—R. O. W.

Marshall, D. **Scottish agriculture during the war.** *Trans. Highl. Agric. Soc. Scot.* **58.** 1–77. 1946. [Dunfermline] **42**

All aspects of Scottish agriculture during the 6 war years are reviewed, and statistical information is also supplied. Cropping systems, live stock statistics, crop yields, prices, and financial returns, weather, labour, the Government tractor service, and hill-cattle subsidy are selected sections which indicate the scope of the review.—M. H.

Jenkin, T. J. **The Welsh Plant Breeding Station.** *Farming.* **1.** 141–148. 1946. [Welsh Plant Breeding Station, Aberystwyth] **43**

An account is given of the history and work of the Station since its establishment in 1919. The studies include the breeding of cereal, grass, and leguminous herbage plants, grassland management, and seed multiplication and distribution.—M. H.

Plant, W. **Survey of mineral deficiencies on tillage land.** *Nature, Lond.* **160.** 336. 1947. [Res. Sta., Long Ashton] **44**

A field technique has been developed at the above Station for determining the nutrient condition of crops by the use of two complementary methods, namely, visual diagnosis and tissue tests. Data obtained of incidence of deficiencies on tillage land in Hereford and Somerset are supplied. A fuller account of methods and results is to be published elsewhere. —M. H.

PESOLA, V. A. Växtförädlingsverksamheten i Finland. [**Plant breeding work in Finland.**] *Lantm. Svenskt Land.* **31.** 542–544. 1947. **45**

The Government Plant Breeding Institute has at its disposal an arable area of 60 ha. on Jokioinen, the Government-owned estate. The practical results of the Institute's work include the following: Toivo autumn rye (Campiner × land rye). From 1936–46 approximately one-third of Finland's rye harvest was obtained from this variety. Ensi, the only bred mid-summer rye, was marketed in 1933; it has excellent over-wintering capacity. In 1941, Pekka rye (Steel rye × Härmä) was placed on the market, and in 1944 Onni rye (Star × land rye) was sold for the first time. The former is adapted to the southerly part of the rye area, and the latter to the northerly localities.

In 1933, the Institute's Sampo autumn wheat (Thule II × land wheat) came on the market. It has given excellent results in Åland and in the Åbo region. Pohjola autumn wheat, derived from Finnish land autumn wheat, was released in 1935, and is designed for the northerly parts of the autumn wheat area. In 1941, however, Olympia wheat came on the market, and has since largely superseded Pohjola. It is even more winter-hardy than Pohjola, but has relatively weak straw and is, like Pohjola, susceptible to yellow rust.

The Institute's first bred spring wheat, Sopu, was marketed in 1935 and was followed by Hopea in 1936. Both are products of a cross between Canadian Marquis and Finnish Ruskea spring wheat. They are intended for the middle and northerly part of Finland's spring wheat area, and in general for areas where the Diamand wheats, owing to their lateness, are uncertain.

In 1935, the black-grained Simo oat appeared from the Institute. It has stiff straw and high yield and is popular with farmers who grow black-oats for fodder. The two-rowed Vankkuri barley (line from a Canadian barley) appeared in 1943. It is a very high yielding groats and fodder barley, and intended for south Finland.

Breeding with potatoes, fibre plants, oil plants, etc., is in progress.—R. P. J.

LEWICKI, S. Stan i możliwości odbudowy rolnictwa lubelskiego na tle ogólno-polskim. [**The present state and possibilities of recovery of agriculture in Lublin county in view of the general Polish situation.**] *Bibl. Puławska.* No. 21. 1–143. 1946. **46**

War activities, enemy administration, changes in borders of districts and municipalities, changes in plant cultivation and animal breeding, migrations of the population, and finally the partition of estates and farms larger than 50 ha. (about 125 acres), destroyed the achievements of Poland in plant cultivation and animal breeding, and completely disorganized agricultural life. Deforestation by the Germans and by the Polish population (lack of fuel) is alarming. It is stated to bring about changes in micro-climate, to cause lowering of the ground-water table, soil erosion, movement of sand, etc. The first task of the new agricultural authorities is the afforestation of the country, especially hill slopes and mountains in the Lublin county, glens and ravines, and barren slopes steeper than 15°. At the same time, cultivated slopes should be arranged into horizontal terraces, improvement of soils and peats should be made, and part of the barren grounds (about 28,000 ha. of 150,000 ha.) might be used for fish farming. All experimental stations have been destroyed by the agricultural reforms, not only in the Lublin county but throughout the country. As the Lublin county is comprised of almost all kinds of soil met in Poland, experimental stations such as those of Zemborzyce (loess), Werbkowice (steppe soil), and Chełm, should be restored. For given conditions (soil, climate, distribution of rain during vegetation season) suitable plants should be chosen to reduce costs and increase production. The Puławy Institute (with the Polish Zootechnical Institute) as the central organization, and regional experimental stations with schools and organizations of the county, are suitable to undertake the work.

Poland's wheat area consisted formerly of 800,000 ha. (producing 900,000 tons per annum of wheat), but 46 per cent of the area is under the control of the Soviet Union, and these losses cannot be recovered from the newly-regained western territories. There is, therefore, need to increase wheat production in the Lublin county at the expense of rye. Of the arable area, 29·4 per cent is under rye, and 13·3 per cent under wheat. Increase of wheat (200,000 ha.) by 50 per cent should increase wheat production by 1,000,000 quintals. At the same time wheat production, which is now very low (12·2 quintals per ha., as against 22 in Germany, 17·5 in Czechoslovakia, 14·3 in Hungary), should be improved. The cheapest way is by proper seed production (increase by 2 quintals or more per ha.), which industry was utterly destroyed during the war. In the central and south-eastern districts of the county, soils are suitable for wheat cultivation, but some are now under rye. Higher level of culture, manuring, better seeds, control of diseases, co-operation of scientists and practical men under the direction of the Puławy Institute, and with the help of district stations and laboratories, should increase wheat production up to the level of self-sufficiency. It is planned to grow 380,000 ha. of rye, 270,000 ha. of wheat, 125,000 ha. of barley, and 180,000 ha. of oats. At least 32,000 ha. (i.e. 2 per cent of arable land) are essential for select (super-élite) seed production and for less than half of the élite and original seed production ; the present area is only 6,750 ha., which includes animal breeding, gardening, and fish farming. Co-operation of farms for growing the same strain of seed, common threshing, cleaning, winnowing, and sorting are necessary. Penalties for wasting of cereal grain and privileges for seed production should be guaranteed. Under the care of specialists, selection of cereals for a given area is planned. The area of rye is too large. Polish rye is high in standard, having a high milling and baking value ; these features should be made the basis for its evaluation. For poorer soils and conditions, Mikulice and Danki rye are suitable and are resistant against smut ; for better soils, Włoszanów (which resembles Petkus) and Rogalin ryes are preferable. Early winter wheat should be cultivated on poorer soils and lower culture ; summer wheat is suitable only with early sowing ("Ostka Chłopicka and Ostka Hildebrand") ; hard wheat of Puławy is suitable for strong soils, good cultivation, and for early sowing.

Malting barley cultivation requires some reorganization to raise it to the pre-war level. Its evaluation should be based again on the quality and suitable amount of protein, and on hereditary adaptation to requirements ; otherwise its price falls to the level of feeding barley. Light yellow colour of grain combined with suitable weight and volume proved to be good external indications of its value. Pre-war barley of the Lublin county did not reach the high level of that of the western counties. The summer barleys Isaria, Skrzeszowice, and malting-Puławy are suitable for good soils and cultivation, Sobieszyn and Granum for light soils and poorer conditions.

Production of oats is not a special problem. Here hereditary features of type and strain are of primary value. For poorer conditions the early yellow oats, and for better ones early white oats, are suitable. Buckwheat can be sown at any time ; it does not require any special soil or culture, and gives "grues" which is very much appreciated by the population. Its selection, however, is completely neglected. Millet is of importance as a subsidiary plant, when it is impossible to sow the planned cereal, as food for young and old poultry, and, to a certain degree, for man ; better strains should be chosen for cultivation. For central and south-eastern districts of the county, maize cultivation should be extended ; special equipment for its cultivation should be produced in Poland.

Sugar beet yield increased before the war from 173 quintals to 198 quintals per ha. ; during the German occupation it fell to 127 quintals, and in 1944–45 to 59 quintals. Cultivation of sugar beet is an index of the general level of agriculture. Some districts of the Lublin county hitherto not used are suitable for sugar beet ; in others (e.g. Hrubiezów) there are good soils for wheat and sugar beet ; communications, however, require to be improved. Fodder beet is most important for raising the general level of agriculture, for improving rations, and for increasing the milk yield. Seed selection, laboratories, experimental fields, and cultivation on private farms are indispensable for a high level of seed production. Before the war Polish beet seeds commanded the world seed market, being better than German seeds, and were exported to almost all countries interested in Europe and America. Previously only large farms (over 50 ha.)—and there were about 1,000 producing beet seeds—had proper buildings and facilities, together with the necessary knowledge. Now there are no large private properties. It is suggested that Polish peasants ought to take up seed production in co-operatives, and that their work should receive privileges and prizes.

The aim with legumes is to increase the arable area under these crops from 3 to 15 per cent. In addition, catch crops and rotation crops should be grown where conditions are suitable. Grain legumes are to be increased to 35,000 ha. within seven years. For peas and beans, the eastern parts of the county are suitable ; for better soils, yellow Victoria peas ; for lighter ones the green Folger and two new strains, early and late, of wax-yellow colour. Beans were formerly produced mostly in the eastern counties, now under Soviet rule ; they provided 60 per cent of the total Polish production. To maintain this level, the area of 1500 ha. in Lublin county should be extended to 3600 ha. This can be done quite easily, as beans have modest demands, but a change must be made from the supported varieties grown in gardens to non-supported varieties grown in fields.—T. JANIKOWSKI.

ГУЩИН, И. В. Сорта полевых культур Красно-Кутской государственной Селекционной Станции. (К 35-летию Станции) *Соц. Зерн. Хоз.* 1946. № 4, стр. 35-40.

GUŠČIN, I. V. [**Varieties of field crops of the Krasno-Kut State Selection Station.**] (35 years' work of the Station). [*Soc. Zern. Hoz.* 1946. No. 4. 35–40. **47**

This Station, one of the oldest selection institutes in the Union, developed from an experimental field to a selection station in 1911. Of spring wheat varieties the Station has evolved Melanopus 69, Hordeiforme 189, and Erythrospermum 841. Melanopus 69 is the most drought resistant of the hard wheats, and, at the same time, is adapted to areas of high rainfall. It may therefore be grown in regions extending from the Ukraine to Siberia. Hordeiforme 189 is specially suitable for the northern parts of the Saratov, Kuĭbyšev and Čkalov regions, and for Baškir ASSR.

Information is given on adaptation to various regions of (*a*) soft wheats, barley (selection of barley began in 1921, and there are now 11 varieties in the trials); of (*b*) *Cicer* sp. (selection started in 1931 and Krasno-Kut 195 is being further tested for resistance to *Ascochyta* sp.; Skorospelka [Early Ripening], Aljfa, and Mogučii are also promising *Cicer* varieties); and (*c*) proso millet (notably the variety Aureum 48 for irrigation under Saratov conditions).—M. H.

КОКИНА, С. И. и КОКИН, А. Я. О содержании дубильных веществ у видов *Calligonum*. *Бот. Ж., СССР.* Том 32, № 1, стр. 23-32. 1947.

KOKINA, S. I. & KOKIN, J. Ja. **[The content of tannins in species of Calligonum.]** *Bot. Ẑ. SSSR.* **32.** 23–32. 1947. **48**

Several species of *Calligonum* growing in the sandy desert of Kara-Kum have been analysed for tannin. Wild species have many qualities for exploitation as industrial crops. As a sand binder, the plant will be useful for desert plantations where these are possible.—M. H.

ДЕМИДЕНКО, Т. Т. и БАРИНОВА, Р. А. Влияние гранулированного суперфосфата на урожай пожнивных культур. *Доклады Акад. Наук СССР.* Том 54, № 3. стр. 247-50. 1946.

DEMIDENKO, T. T., & BARINOVA, R. A. **Effect of granulated superphosphate upon the yield of stubble-field crops.** *C.R.* (*Doklady*) *Acad. Sci. URSS.* **54.** 247–250. 1946. **49**

The experiments were made with millet and buckwheat at the Zakatal Agricultural Experiment Station, Azerbaĭdžan. In the Nuhino-Zakatal valley the precipitation is 900 mm. p.a., and the growing period lasts seven months (from 1st April to 1st November). The data include P_2O_5 uptake by young seedlings when superphosphate is (1) mixed with the seeds before sowing, and (2) applied before ploughing. Variation in NO_3 and P_2O_5 content at the seedling, flowering, and harvesting stages of these plants under the two types of superphosphate application is recorded, together with the effects on yield and P_2O_5 content of the seed.—M. H.

DANDOUAU, A. Ressources naturelles à Madagascar et évolution de l'agriculture dans l'île. **[Natural resources of Madagascar and development of agriculture in the island.]** *Rev. Bot. appl.* **26.** 370–377. 1946. **50**

A resumé of forests, crops, and animal production in the geographical regions of Madagascar.—D. B.

DUCKER, H. C., & HOYLE, S. T. **Some studies on cultivation practices, food crops and the maintenance of fertility at the Cotton Station, Nyasaland.** *E. Afr. Agric. J.* **13.** 107–113. 1947. [Empire Cotton Growing Corpn. Nyasaland] **51**

A summary of general investigations that have been undertaken at the Cotton Station, Nyasaland, since it was opened in 1930. The main experiment was a factorial one comparing ridge and flat cultivation, early and late preparation of fields, and three levels of digging. —G. M. H.

RASUL, K. **Punjab.** *Indian Fmg* **7.** 421–423. 1946. [Punjab Agric. Coll., Lyallpur] **52**

Climatic and crop conditions are reported for the last quarter of 1945, together with the outstanding results of recent agricultural research conducted in the Province. Three selections of hill rices have been released, and, in addition to the new improved cotton variety, Victory, for the south-eastern Punjab, five other strains have been bred for greater lint length and higher yield.—M. E. E.

BARNETT, H. L. **A brief review of essential foodcrop cultivation in Malaya.** *Malay. Agric. J.* **30.** 13–18. 1947. [Acting Agric. Economist, Malaya] **53**

In the 1945–46 season the area under padi (789,640 acres) had fallen by less than 4 per cent compared with 1941, but the yield of rice (225,000 tons) showed a decrease of nearly 31 per cent. Several factors were responsible for this reduced yield. Planting was carried out just before and after the liberation, so that the same adherence to planting dates was not observed as in former years, irrigation systems had suffered serious neglect, and, as a result of Japanese interference, there was a considerable loss of high-yielding padi seed, pure strains were mixed, and lower yields harvested. There were also serious depredations by wild pigs, squirrels, rats, pests which have increased enormously during the occupation.

With the return of the British, people who had left the towns and moved into the country, cleared the jungle, and developed new foodcrop areas under compulsion during the Japanese occupation, returned once again to the towns. Thus, inevitably, a reduction in foodcrop acreages occurred. The revival of the rubber industry, the cultivation of padi, and damage caused by wild pig are other factors affecting foodcrop cultivation. Nevertheless, acreages under tapioca, sweet potato, colocasia, sugar cane, ragi, and banana show a satisfactory increase over 1940 figures. There is a big reduction in the area under pineapple due to the loss of the large acreage in Johore which formerly supplied fruit for the important pineapple canning industry of Malaya. This reduction in area follows on neglect during the Japanese occupation.

A proclamation in 1946 required all estates to plant a minimum of 2 per cent of their acreage with foodcrops. By the end of the third quarter, 1946, this had meant an addition of over 32,000 acres. Three tables give (1) Area of Land planted in Malaya and Yields of Padi, season 1945–46; (2) Comparative Table of Areas under Essential Foodcrop Cultivation; and (3) Estate Production of Palm Oil and Kernels, May to December, 1946. —G. M. H.

Journal of the Department of Agriculture, Victoria. **Mallee Research Station—Experimental work and results.** *J. Dept. Agric. Vict.* **44.** 409–416, 434–440, 465–476, 526–537, and 539. 1946. **54**

A short history of this Station, established in north-western Victoria since 1932, is followed by a description of its scope of activities. The experimental work can be grouped into four categories: (1) experiments with cereals; (2) investigation into fodder crops and pastures for the Mallee; (3) sand drift investigations; and (4) sheep experiments.

The wheat varieties Insignia, Pindar, Bencubbin, Ranee 4H, and Regalia are all grown for seed production and distribution to Mallee farmers. Insignia, resulting from a cross between Ghurka and Ranee 4H, was named in 1946. It is an early wheat with short strong straw, smut resistance, and the ability to outyield all other varieties by 0·8 to 1·3 bushels per acre. Apart from variety trials, there are also trials conducted on the manurial, seeding, and cultivation and rotation aspects of wheat growing. In all cases the randomized block system is employed, and some trials have been sown on the factorial design, enabling statistical comparisons to be made between different treatments.

Similarly conducted experimental work has been carried out with oats. Varieties now used in seed production are Mulga, Dawn, Algeribee (arranged in order of maturity) and the high grain-yielding Palestine × Dawn R4-1-1. A seeding rate of 50 lb. per acre gives satisfactory hay yields under Mallee conditions, but rates up to 90 lb. per acre produce some increase in grain yields. Oat grazing trials show the importance of the different varieties for obtaining an even supply of feed throughout the season. Winter grazing is provided by rye which grows well under difficult conditions and outyields other cereals for total green fodder. The commonly grown rye variety is Black Winter, but a South Australian strain is now being used for seed production in Victoria. Other crops used in experiments are barley, field peas, and linseed.

Control measures against drifting sand have been tested on cultivated and non-cultivated land. A standard seeding rate of 45 lb. of rye per acre with a dressing of 50 lb. superphosphate is recommended for erosion control.—M. E. E.

Breakwell, E. J., & Jones, R. H. **Cropping results at Roseworthy College, 1945-46.** *J. Dept. Agric. S. Aust.* **50.** 252–256. 1946. **55**

Report on the growth of crops of cereal hay, barley, oats, peas, and other crops, and of the success of crops grown on grassland (leys of clover and medicks with the grasses) without a fallow preparation.—R. O. W.

Minnesota Agricultural Experiment Station. Bull. 390. **Supplementary and emergency crops for Minnesota.** By *A. C. Arny*, *R. O. Bridgford*, and *R. Crim.* 1946. pp. 23. **56**

Results of comparisons between pure sowings and mixtures of sorghum, maize, Sudan grass, and soybeans, under varying seasonal conditions sometimes favouring lodging, and a report on varietal trials with millet and sorghum. —R. O. W.

ECONOMICS OF CROP PRODUCTION

Edinburgh and East of Scotland College of Agriculture (Department of Economics). Bull. No. 4. **Report on financial results of 46 East of Scotland farms for 1945-46.** By *D. Witney*, *W. B. Duthie*, and *D. M. R. Leask.* 1947. pp. 17. **57**

EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE (DEPARTMENT OF ECONOMICS). Bull. No. 5. **Report on financial results of 154 East of Scotland farms for 1945-46.** By *D. Witney* and *W. B. Duthie*. 1947. pp. 25. **58**

Detailed analysis of results from 26 hill-sheep farms, 20 stock-rearing farms, 35 stock-raising and feeding farms, 82 arable farms, and 37 dairy farms.—R. O. W.

SCOTLAND, DEPARTMENT OF AGRICULTURE. **Scottish Farming—Twelfth Economic Report, 1941-42 to 1944-45.** 1947. pp. 99. [Mimeographed.] **59**

EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE. Bull. No. 2. **Economic aspects of war-time farming—East and South-East Scotland, 1939-40 to 1944-45.** By *J. D. Nutt*. 1947. pp. 102. **60**

A comprehensive study of the economics (primarily profitability) of farming in south-east Scotland, with reference to acreage, capital invested, intensity, and distribution of capital, as affected the following types of farms: hill-sheep, rearing, mixed, arable, and dairy.—R. O. W.

JONES, R. B. **Variations in sources of farm receipts.** *Fm. Econ.* **13.** 2–4. 1947. [Farm Econ. Br., Dept. Agric. Scotland] **61**

An analysis of accounts from five main types of farms, namely: hill-sheep, stock-raising, stock-raising and feeding, arable with stock-feeding, and dairy, collected from the colleges at Aberdeen, Edinburgh, and Glasgow. —R. O. W.

EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE (ECONOMICS DEPARTMENT.) Farmers' Leafl. No. 1. **1945 crop costs studies. I.—Oats. II.—Potatoes. III.—Sugar beet.** By *D. Witney* and others. 1946. pp. 16. [Mimeographed.] **62**

Investigations have been conducted as enterprise studies based on farmers' returns for 1945; the studies are to continue for 1946 and 1947. Results for oats emphasize the difficulty of obtaining a satisfactory cost of production figure for this crop, grown on farms varying widely in size, management, soil, altitude, and climate. Costs for potatoes are very varied, and dependent on many factors, including the purpose for which the crop is grown. With sugar beet in 1945 (a year better than average in yields), an 8-ton crop would just about cover costs of production, without allowing any profit, any management salary, any interest on capital, or any margin for contingencies.—R. O. W.

UNIVERSITY OF BRISTOL (DEPARTMENT OF ECONOMICS). **Notes on farm economics. Worcester and Gloucester groups. Comparative tables of farming results for the cropping year 1945.** By *G. A. Hiscocks*. 1947. pp. 26. [Mimeographed.] **63**

UNIVERSITY OF BRISTOL (DEPARTMENT OF ECONOMICS). **Notes on farm economics. Herefordshire farms. Comparative tables of farming results for the cropping year 1945.** By *G. H. Caudwell*. 1947. pp. 9. [Mimeographed.] **64**

UNIVERSITY OF BRISTOL (DEPARTMENT OF ECONOMICS). **Notes on farm economics. Somerset group. Comparative tables of farming results for the cropping year 1945.** By *L. J. Hewett*. 1947. pp. 14. [Mimeographed.] **65**

A group of studies on production and costings on farms in types of farming areas in the English counties noted above.—R. O. W.

UNIVERSITY OF BRISTOL (DEPARTMENT OF ECONOMICS). **Notes on farm economics. Wiltshire farms. Comparative tables of farming results for the cropping year 1945.** By *V. H. Beynon*. 1946. pp. 14. [Mimeographed.] **66**

Financial results are given for 46 farms in Wiltshire in 1945. Some of the farms are of the Wiltshire Down and Cotswold group, being mostly large farms with milk and cereals as main lines of production, and others of the Wiltshire Vale group, smaller in size and mostly dairy farms.—R. O. W.

WYE COLLEGE (UNIVERSITY OF LONDON). Department of Economics Rep. No. 40. **Investigation into farming costs of production and financial results. Costs of production and financial results for potatoes, sugar beet, mangels, and kale, 1939 to 1945.** By *J. Wyllie*. 1947. pp. 142. **67**

The financial results for potatoes, sugar beet, mangels, and kale on a number of farms in the south-eastern counties for the seven years 1939–45 are presented and analysed, all the results being abstracted from complete cost accounts.—P. M.

MACHINERY AND EQUIPMENT

Edinburgh and East of Scotland College of Agriculture (Department of Economics). Bull. No. 6. **Economic aspects of farm mechanisation. 1945-46 tractor costs and performance.** By *D. Witney* and *H. Christine McIver*. 1947. pp. 14. [Mimeographed.] **68**

The second report of this nature, and provides an up-to-date and detailed review of tractor use, performance, and costs of operations.—P. M.

Beilby, O. J. **Tractors on Scottish farms.** *Fm. Econ.* **13.** 11–13. 1947. [Farm Econ. Br., Dept. Agric. Scotland] **69**

Returns are analysed in relation to size of holdings in acres of crops and grass, and per 1000 acres of tillage.—R. O. W.

McIver, H. Christine. **Tractor performance in the east of Scotland, 1945-46.** *Fm. Econ.* **13.** 13–15. 1947. [Edinb. and E. of Scotland Coll. Agric.] **70**

Tables show comparisons between light, medium, and heavy wheeled tractors and track-laying tractors in normal farm operations.—R. O. W.

Davies, C. **The mechanisation of Lincolnshire farms.** *J. Minist. Agric.* **54.** 168–170. 1947. **71**

Before the war the percentage of arable land in the three divisions of Lincolnshire was high (nearly a million acres from a total of 1·75 million), and therefore it was not greatly increased by the ploughing campaign. The machinery numbers, however, have enormously increased, and have led to a greater output per man.—M. H.

Andal, M. E. **Use of power machinery in bush land improvement in north-eastern Saskatchewan.** *Econ. Annalist.* **17.** 32–37. 1947. **72**

Power equipment (tractors, cutters, pilers, bulldozers, and accessory equipment) has done away with the laborious task of hand methods of clearing land, and has made it possible for settlers to place their farm unit on a paying basis relatively quickly.—R. O. W.

SEEDS

Condon, Marjorie Z., Andrews, F. R., Lambou, Madeline G., & Altschul, A. M. **Inhibition of heating and lipolysis in seeds.** *Science* **105.** 525–527. 1947. [Southern Reg. Res. Lab., New Orleans, Louisiana] **73**

Damage resulting from heating of moist seeds in storage is manifest by discoloration of seeds and by reduced quantity and quality of the processed product. Heating during storage can be minimized by drying prior to storage, forced aeration during storage, stacking of bagged seeds in such a way as to allow circulation of air, and by treating with chemicals which inhibit the biological processes responsible for heating and deterioration. This last method has been investigated. Results are given of the effect of various concentrations of a wide variety of chemicals on the inhibition of heating and lipolysis. Low concentrations of these chemicals have been effective on flax seed, cotton seed, rice and grain sorghum. Preservation of viability was not important in these experiments because the seeds are used for food or industrial purposes. Mill-scale experiments are in progress.—D. B.

DISEASES AND PESTS

Hogan, T. W. & Slape, H. W. **Aerial spraying for the control of agricultural pests in Victoria.** *J. Dep. Agric. Vict.* **44.** 553–558 and 562. 1946. **74**

A series of aerial-spraying trials have been conducted against two agricultural pests, the Rutherglen Bug (*Nysius vinitor* Berg.) and the Australian Plague Locust (*Chortoicetes terminifera* Walk.). In initial tests against the Rutherglen Bug, the malaria-control method of dispersing D.D.T. from aircraft was used, but, following unsatisfactory results, modifications were made to the method of dispersion and to the selection which resulted in satisfactory control being obtained.

The experiments were continued against the Australian Plague Locust, and satisfactory results were obtained with a triple-spray bar, which is described, and a 4 per cent solution of benzene hexachloride (13 per cent gamma isomer) in diesel fuel oil. Methods of conducting field trials, the importance of the volability of the solvent carrier, and of particle size are discussed. A Beaufort Mark IX aircraft has been used throughout the trials, and has been modified to carry 520 gallons of solution.

The method is now in use on a large scale against an outbreak of locusts in northern Victoria.—Authors' summary.

Michigan Agricultural Experiment Station. Ext. Folder F-111. **Recommended fungicides for the control of plant diseases.** By *L. C. Knorr.* 1947. pp. 11. **75**

SMITH, F. G., LINK, K. P., & WALKER, J. C. **Acidic and phenolic fractions of crucifer roots in relation to clubroot.** *J. Agric. Res.* **14.** 193–204. 1947. [Wisconsin Agric. Exp. Sta., Madison] **76**

This is a study of fungicidal constituents of the host plant. The hosts studied were *Brassica rapa, B. oleracea* var. *capitata, B. napus* and *B. nigra,* and the fungicidal activity of plant extracts was determined on *Colletotrichum circinans.*

The method of testing toxicity of the phenols to the fungus and the two colorimetric methods (Folin technique and diazo technique) for estimating phenols in the host are described. Tests failed to show any clear correlation between phenol content, acidity, and fungicidal activity and resistance. The possibility still remains, however, that fungicidal compounds are produced during invasion by the fungus, their production being caused in response to special stimuli or derangement of normal metabolism.—D. B.

WEEDS

LEEDS UNIVERSITY DEPARTMENT OF AGRICULTURE. **Bracken eradication trials in the West Riding of Yorkshire, 1945.** 1945. pp. 3. [Mimeographed.] **77**

Trials were carried out at four centres. Cutting or rolling must be carried out either in the latter half of June, or in the latter half of June and again in the second week of September. When these times were adhered to results were moderately successful.

A 4 per cent powder of C.L.C. applied at 3 cwt. per acre in the latter end of June produced a twisting of the shoots and a yellowing of the terminals. A fortnight later the yellowing disappeared, and although the shoots remained twisted they continued to grow. Further application might be more successful.

Sodium chlorate at 3 cwt. per acre was applied to plots on 29th June and again on 27th July. Surface bracken was completely killed, and there was considerable damage to shoots and rhizomes below the ground.—P. M.

BUDD, A. C. **Vegetative characters of common western weed seedlings as an aid to their identification.** *Sci. Agric.* **27.** 322–332. 1947. **78**

About 80 species of common Western Canadian weeds were grown at the Dominion Experimental Station, Swift Current, Sask., in order to study their vegetative characters. A summary of these characters is presented in tabular form, and their value for the identification of weed seedlings is discussed. Features by which certain groups of similar appearance may be distinguished are brought out in the text.—Author's summary.

CEREALS

FÖRSÖK OCH FORSKNING. Så höstsäden i rätt tid. [**Sow autumn cereals at the right time.**] *Försök och Forskning.* **3.** 113–114. 1946. **79**

The date of sowing should be chosen so that the crop attains the most suitable stage of development for over-wintering before the winter sets in. Experiments conducted in recent years by the Institute of Agricultural Research to determine the most suitable time for sowing autumn wheat in various parts of Sweden have given the following results: the most southerly part of Götaland—20th–25th September; the rest of Götaland—10th–15th September; South Svealand—1st–5th September; North Svealand and South Norrland—20th–25th August.

The Institute has computed that sowing later than the dates indicated entails a reduction in yield amounting for the first 10-day period to approximately 10 per cent or more than 300 kg., and for the next 10-day period to a further 15 to 20 per cent.

Sowing of autumn rye, particularly on poor sandy soils, should be carried out 8 to 14 days earlier than the dates specified for wheat, and in Norrland should take place in the first half of August. If sowing is unavoidably delayed, the rate of seeding should be increased slightly. A small amount of nitrogen in artificial manure applied at the time of sowing will accelerate growth.—R. P. J.

ÅKERMAN, Å. Höstgrödornas övervintring innevarande år. Skadorna större än under de stränga vintrarna 1940–42. [**Overwintering of autumn-sown crops in the current year. Injuries greater than during the severe winters 1940-42.**] *Lantm. Svenskt Land.* **31.** 439–441. 1947. **80**

The bread grains grown in Sweden are predominantly autumn-sown crops of wheat and rye. In 1946, the areas of these autumn cereals in Svealand and Götaland were respectively 212,332 and 152,682 ha., compared with 90,473 ha. spring wheat and only 5,358 ha. spring rye. The harvest of autumn wheat is computed to have amounted to 524,163 tons, and of autumn rye to 283, 951 tons compared with 151,518 tons spring wheat and 4,846 tons spring rye.

Owing to the protracted and very severe winter, the absence during part of the cold period of a protective covering of snow, and a biting wind, the wheat fields have in large areas suffered very serious injury. Much damage was also caused to autumn-sown barley and autumn-sown rape. Tabulated data furnished by the agricultural societies in the different Swedish provinces show how autumn-sown cereals have over-wintered and the extent of the areas which had to be resown. A survey of over-wintering of autumn-sown cereals in the springs of 1941, 1942, 1943, 1944, 1945, 1946, and 1947 (average figures) is included.—R. P. J.

ELIASSON, S. Valet av vårstråsäd. Odlingen av vårvete och korn kan och bör öka på havrens bekostnad. [**Choice of spring cereal crops. The cultivation of spring wheat and barley can, and should, increase at the expense of oats.**] *Lantm. Svenskt Land.* **31.** 219–222. 1947. **81**

In Sweden unfavourable weather in the autumn of 1946 made the sowing of autumn cereals very difficult. Only in Norrland could sowing be carried out at the right time, while in other parts of the country it was much delayed, and in large areas, particularly in west Sweden, it had to be omitted altogether.

In 1946, in the whole country, the area sown with autumn cereals was nearly 70,000 ha. smaller than in 1945 (40,000 ha. wheat and 30,000 rye). Compared with 1938, the decline was 115,000 ha. (75,000 ha. wheat and 40,000 ha. rye). Owing to import difficulties, supplying the nation with bread grain will present some problems during the consumption year 1947–48.

Results of comparisons between spring wheat, barley, and oats indicate that with present prices spring wheat has, on the average, given a decidedly better return than oats throughout south and middle Sweden. It has also been slightly more remunerative than barley in south and middle Sweden except in the dry areas of Götaland, where no spring cereal crop can compete with barley. Spring wheat has surpassed barley in particular on the ploughed-up ley, and on soils with a relatively low reaction.

Barley has been superior to oats in yield of fodder units (grain) in south and middle Sweden. Slightly better results are given by oats in north-west Götaland and in Värmland than in other parts of south and middle Sweden. The cause of the lower feed value of oats is its higher husk content (approximately 25 per cent compared with 9 per cent in barley).

Results of experiments show that in south and middle Sweden, with a transition from oats to barley, there is a loss of 10 to 15 per cent straw, but a gain of 20 per cent fodder units in the grain crop. This applies to mineral soils. On humus and peat soils oats give better results, although in experiments at Flahult Experiment Station barley has given good yields on some peat soils.

Trials in Norrland show that in barley the yield of fodder units in the grain is more than 30 per cent higher than in oats (nearly 20 per cent in the Jämtland Silurian area, and nearly 40 per cent in the other parts of Norrland). In Norrland, oats to be harvested ripe should be grown only under conditions specially favourable to this cereal.

The sowing of a mixture of barley and oats is justifiable only when it is not known which variety of cereal is the more suitable for the particular area.—R. P. J.

ÅKERMAN, Å. Brödsädesodlingens fredsplanering och därav föranledda krav på växtförädlingen. [**Planning for peace-time cultivation of bread grain, and the demands on plant breeding occasioned by it.**] *Svensk Jordbr Forsk. Årsbok.* 1946. 64–68. [Director, Swedish Seed Association] **82**

During the period 1919–40, as a result of plant breeding combined with improved tillage and more liberal manuring, the yield of autumn wheat and autumn rye increased on the average by 20 kg. per ha. per year. For spring wheat, the corresponding figure was 30 kg. Growers must strive to improve the quality of their crops. The scales of payment must be revised so that better prices are received for seed lots of the best quality as compared with those of inferior quality.

The question of a reduction in the bread grain area and an increase in the area under oil crops is discussed. The importance of the cultivation of winter barley (valuable pig fodder) and of an increase in vegetable growing and seed production is emphasized.—R. P. J.

BAYLES, B. B. **Technical co-operation in small grain improvement.** *J. Amer. Soc. Agron.* **39.** 207–213. 1947. [Div. Cereal Crops and Diseases, Bur. Plant Ind., U.S. Dept. Agric.] **83**

The national wheat improvement programme, which is conducted by state and federal scientists, is sub-divided into five regional programmes, according to the type of wheat grown and the region where grown. These are the Hard Red Winter, Hard Red Spring, Durum, Eastern Soft Winter, and the region of the Rocky Mountain and Pacific Coast States which grow winter and spring, red and white, soft and hard varieties. Since the environmental factors that determine the areas where the different types are grown also determine problems of disease, insects, and quality, these problems of wheat improvement and production are simplified by being similar within a region. Examples of co-ordination of research improvement of barley, oats, and rice are also given.—D. B.

CHINOY, J. J. **Effect of spacing on yield of wheat.** *Curr. Sci.* **16.** 121. 1947. [Indian Agric. Res. Inst., New Delhi] **84**

The effects of a heavier seed rate and closer spacing on *Triticum vulgare* were studied on dry and irrigated land. Significantly higher yields of both grain and straw were obtained by sowing 100 lb. of seed per acre and by using a 6-in. spacing between the rows.—M. E. E.

ELIASSON, S. Blandsädesodlingen breder ut sig. Preliminära resultat av jämförande försök med havre, korn och blandsäd. [**The cultivation of mixed grain is increasing. Preliminary results of comparative trials with oats, barley, and mixed grain.**] *Lantm. Svenskt Land.* **31.** 459–460 and 487. 1947. **85**

Results of trials indicate that barley alone has given the highest fodder unit yield of grain in south and middle Sweden, except in north-west Götaland and in Värmland, where a mixture of half oats and half barley was well able to compete with it. The sowing of mixed grain has its greatest justification where barley alone makes relatively poor growth, that is on soils with low reaction and on broken-up leys. Wherever barley grows well, the highest fodder unit yield is obtained by sowing barley alone. An increase in barley cultivation is to be recommended in south-east Sweden, and an increase in mixed grain cultivation in the north-west of the country.

Better results are obtained by sowing a cereal mixture containing in addition legume seed ; part of the cereal grain should be barley. By growing such a mixture the same fodder unit yield can be attained as by growing barley alone, and the yield of crude protein is increased by approximately 50 per cent.—R. P. J.

НОСАТОВСКИЙ, А. И. Теоретическое обоснование оптимального срока посева озимой пшеницы. *Доклады Всесоюз. Акад. С.-Х. Наук* 1946. № 11-12, стр. 17-20.

NOSATOVSKIĬ, A. I. [**Theoretical considerations for determining the optimum time of sowing winter wheat.**] *Doklady Vsesojuz. Akad. S.-H. Nauk* 1946. No. 11–12. 17–20. [The Krasnodar Inst. Food Industry.] **86**

Numerous experiments carried out over a period of 20 years in the southern provinces of European U.S.S.R. indicated that the highest yields of grain were obtained from crops in which the average number of shoots per plant, prior to the onset of winter, was 1·5 to 2·8, and the density of stand was 280 to 400 plants per sq. m. A total of 580°C. was required to bring about such a development in plants during the period from sowing to beginning of tillering. The periods of sowing calculated on this basis were, in a large measure, identical with those recorded experimentally in southern Russia, varying from the 20th August to 25th September. The constant—580°C.—was a sound criterion for calculating the optimum time of sowing where the soil contained sufficient amount of nutrients and water to ensure the appearance of shoots in 6–10 days after sowing.—H. F.

NEW SOUTH WALES (DEPARTMENT OF AGRICULTURE), Division of Plant Industry. **Maize. Points in its profitable production.** By *W. D. Kerle.* 1945. pp. 15. **87**

A considerable quantity of *Zea mays* is grown for fodder in this State, where some areas offer ideal conditions of soil and climate. The importance of manures and fertilizers, the benefits resulting from rotation with red clover, and the advantages obtained by correct preparation of the soil and seed selection are all emphasized. Instructions are given for sowing, cultivation, and harvesting, and there is a detailed list of varieties recommended for grain and for green fodder and silage.—M. E. E.

ГАЛКИНА, А. Культура риса в совхозах. *Совхоз. Производ.* 1945. № 10, стр. 15-8.

GALKINA, A. [**Cultivation of rice in sovhozes.**] *Sovhoz. Proizvod.* 1945. No. 10. 15–18. **88**

The importance of rice in an agricultural economy is shown by the fact that in U.S.A. the area under rice in the last ten years has risen by 80 per cent, and in the U.S.S.R. in the four years of war the area increased by 41 per cent. The possibilities of cultivating rice in Central Asia, in the Kuban, and the Far East are noted. The need for a system of crop rotation with rice is stressed, and a rotation suitable for the Krasnodar area includes the sowing of perennial grasses. For the Far East, suitable grasses for this purpose are not yet available, and therefore a fallow or sowing of soybean should constitute part of the rice rotation. The need for reconstruction of the irrigation system and for mechanization of all processes, from preparation of the soil to cleaning of the seed, are aspects discussed.—M. H.

PRIANIŠNIKOV, D. N. **Some war-time agricultural problems in the Soviet Union.** *Foreign Agric.* **9.** 146–150. 1945. [Timirjazev Agric. Acad., Moscow] **89**

The problems concern production of new crops in Soviet Central Asia and the need for additional sources of fertilizers. It has been estimated that for every hundred parts of nitrogen withdrawn by crops there were returned :—

	By manure.	*By mineral fertilizer.*
In Germany ..	42 parts.	22 parts.
In Uzbekistan ..	20 parts.	55 parts.

These ratios are the more paradoxical because in Germany only 10 per cent of the arable area was sown to clover mixtures, whereas in Uzbekistan 25 per cent of the irrigated area is sown to alfalfa, which, in that climate, yields four cuttings per year, and should provide forage and therefore manure. In Uzbekistan, the N of the liquid manure goes to waste owing to lack of straw, the grain crops having been excluded from the crop rotation on irrigated land in order to provide more space for cotton. It has further been estimated that for every hectare of cotton planted there should be 80 kg. (71 lb. per acre) of N available from the manure of alfalfa-fed animals. Actually, however, the cotton fields receive in the form of manure only 15 kg. N per ha. (13 lb. per acre). Rotations to remedy this situation are suggested and include cotton on only five-eighths of the land, which during eight years, should be placed under cotton, alfalfa, and cereals.

The inclusion of sugar beet in the cotton rotation is also recommended for its abundant yields of fodder and, consequently, of manure, which restores the depleted soils. Experiments in sun-drying of the beet on a Samarkand collective farm have been successful, and the supply of phosphates required by this crop should be obtained by plans which have been initiated for the development of the phosphorite deposits recently discovered in the Karatau Mountains.

Because of the depletion in live-stock numbers, measures for growing *Lupinus* sp. and other legumes as green manures are advocated. —M. H.

Tidbury, G. E. **The cultivation of rice land between successive crops.** *E. Afr. Agric. J.* **12.** 212–215. 1947. [Zanzibar.] **90**

A large-scale cultivation of rice became general throughout Zanzibar in 1942 due to losses in imports from Burma. It was anticipated that conditions would result in decline of fertility and yields. Results of a test covering four years to determine effects of cultivation practices in the Protectorate are recorded. Increased yields of rice are obtained if, after harvest, the stubble is burnt, the land thrown up into large ridges and then planted with a pulse such as cowpeas. Removal of the weed or pulse trash for composting off the field (the compost being applied later to the rice) reduced yields.—M. H.

Mendes, C. T. A rotação de culturas. [**Crop rotation.**] *Rev. Agric. Piracicaba* **21.** 319–326. 1946. **91**

Crop rotation is discussed in relation to rice growing in the Brazilian State of São Paulo, which takes place in three types of land, namely : uplands, generally siliceous and very fresh ; humid lowlands, generally clay and flooded in the most rainy months ; valley or plains, under irrigation. In the uplands it is simple to grow another crop after the rice, preferably a plant of another family and, if green manure is required, a legume sown in October or November and ploughed into the soil in April or May. The other two types of land present more difficulty because of their occasionally excessive moisture and the possibility of frosts in the lowlands. Suggestions for simple drainage are made, and *Canavalia ensiformis* is mentioned as a legume which will readily tolerate the winter conditions of São Paulo. Winter rye, for silage or grain, is another possible crop.—G. M. R.

ГАЛЬЧЕНКО, И. Н. О полегании яровой пшеницы при орошенни на Юго-Востоке. *Соц. Зерн. Хоз.* 1946. *№* 2-3, стр. 132-44.
Galjčenko, I. N. [**Lodging of spring wheat under irrigation in the south-east USSR.**] *Soc. Zern. Hoz.* 1946. No. 2–3. 132–144. **92**

Results of experiments conducted in 1945 confirm those obtained in 1944 that by an alteration in the doses and proportions of mineral fertilizers it is possible under field conditions to reduce the growth of the plant and so increase the resistance of the plants to lodging. A reduction in the yield of grain does not necessarily accompany the reduction in the accumulation of vegetative growth. Under conditions during the vegetative period such as abundant precipitation, increased cloudiness, and frequent wind, two types of lodging were noted—root and stem. Lodging of roots occurred at the time of the last watering, and of stems during the time of the rains. The carrying out of watering during ripening—milk ripeness, when the ear is already heavy with the ripened grain—leads to lodging of the plants. To obviate lodging, the last watering should, as far as possible, take place earlier. As cessation of watering at an early date can reduce the yield, it is necessary that the soil should have received an abundant supply of moisture beforehand. To prevent lodging of the stems, it is necessary to endeavour to grow plants as far as possible with little vegetative growth, stiff straw, which it is possible to attain by moderate nitrogenous feeding of the plants, and with a wide ratio between nitrogen and phosphorus. Postponement of the application of nitrogen to the period of shooting of the stems prevents lodging, but does not guarantee that the highest yields of grain will be obtained. Risk to the yield is obviated by applying the first dose of nitrogen before sowing. As a result of combining the series of measures under the experimental conditions of 1945, there was a considerable reduction, and in some variants even a complete prevention, of lodging of the plants, while at the same time a high yield of grain was obtained. Success in obviating lodging was achieved by the combination of a variety of wheat resistant to lodging, moderate doses of nitrogen, and early termination of the irrigating period with thorough moistening of the soil beforehand.

High yields of grain (45 to 50 centners) were obtained mainly on account of the large number of fertile stems per unit area (750–815 per sq. m.) and the high absolute weight of the grain (up to 38 grm.).—R. P. J.

MONTHLY BULLETIN OF AGRICULTURAL SCIENCE AND PRACTICE. **New system of wheat cultivation.** *Mon. Bull. agric. Sci. Prac.* **37.** 197T. 1946. **93**

The new method is based on alternate strips of wheat and fallow. The strips of wheat (seven rows, 20 cm. apart, of drilled seed) and fallow are interchanged the following year. For economic reasons it is preferable to intercalate the wheat and fallow system in a longer and more varied rotation : wheat and fallow—fallow and wheat—root crops—oats—purple clover. Root crops, which require many and varied cultivation operations, are very suitable for changing the lay-out from cultivation in strips to uniform cultivation.—D. B.

SAGARMINAGA, R. C. Ensayo de riego en trigo. [**Experiment in the irrigation of wheat.**] *Agric tec. Chile* **7.** 5–19. [English summary, 18–19.] 1947. [Dep. Genetics, Min. Agric., Chile] **94**

An experiment was made in the irrigation of wheat at the Paine Experiment Station, Chile, in 1944 and 1945. Sixteen treatments were tested, in five-fold replication and in plots 5 m. by 2 m. Rainfall at the beginning of the growth period was considerable, as is normally the case in the locality, but insignificant afterwards. Water was applied at four different stages of development, namely tillering, boot, heading, and 20 days after heading. The exact amount of water was not measured, but it was endeavoured to soak the soil at a depth below the wheat roots. The two years' results showed irrigation to have a great effect on yield, application at the heading stage being the most beneficial. Application 20 days after heading had no effect. One application is not enough for wheat, and two applications at well-chosen times produce the same result as three or four less well-timed applications. Thus plots irrigated at the boot and heading stages, or at the tillering and heading stages, were practically equal in yield to plots receiving four applications. The other two-application treatments yielded less than the four-application treatments. The best combination of three applications was that in which irrigation was done at the tillering, booting, and heading stage. Under weather conditions such as those prevailing in 1944 and 1945, two applications, either at booting or heading or at tillering and heading, are enough for wheat growing in Paine. —Author's summary.

BONNETT, O. T., & BEVER, W. M. **Head-hill method of planting head selections of small grains.** *J. Amer. Soc. Agron.* **39.** 442–445. 1947. [Illinois Agric. Exp. Sta. (O.T.B.) and Div. Cer. Crops and Diseases, U.S.D.A., Urbana, Ill. (W.M.B.)] **95**

Head-hill planting of head selections of wheat and oats is preferred to the head-row method. The technique is described and the advantages stated.—D. B.

WARD, R. E. **Northern Great Plains as producer of wheat.** *Econ. Geogr.* **22.** 231–244. 1946. [Bur. Agric. Econ., U.S.D.A., Lincoln, Neb.] **96**

A review of the industry, technique of its production, its present economic position and future potentialities in a region where wheat is likely to remain the most important crop.—R. O. W.

MCPHERSON, G. K. **More wheat needed.** *N.Z. J. Agric.* **74.** 113–126. 1947. [Ashburton] **97**

The history of wheat growing in New Zealand is described, together with the place of wheat in the rotation, growing and harvesting the crop, the chief varieties grown, and diseases and pests of wheat.—M. H.

"COMMONWEALTH" AGRICULTURIST (THE). **The wheat crop.** *Commonw. Agricst.* **17.** 79–87. 1947. **98**

An average yield of only 9·44 bushels per acre was obtained for the 1946–47 season in Australia, due mainly to the drought and other unfavourable conditions in Queensland and New South Wales. The main areas in Victoria gave satisfactory wheat crops, and competitions in the different districts are described. In the Riverina, wheat crops were irrigated late during the season when high temperatures were conducive to rust development, so that the subsequent yields were very poor. After descriptions of trials on various soils, there are notes on the diseases of cereals and in particular on those of wheat.—M. E. E.

CHRISTCHURCH, N.Z., WHEAT RESEARCH INSTITUTE. Publ. No. 48. **New Zealand wheat review, 1946.** 1947. pp. 72. **99**

While wheat growing in New Zealand recently has suffered from certain climatic and economic handicaps, there are positive signs that the industry is progressing. Mechanization has made great progress, and 84·5 per cent of the wheat area was harvested with "headers" in 1946. New wheat varieties have reduced losses due to weather, and the average wheat yield in New Zealand is 33 bushels per acre. This issue of the review contains 20 papers on various aspects of wheat growing in New Zealand.—M. H.

LATHBURY, R. J. **The development of wheat varieties in Kenya.** *Emp. J. exp. Agric.* **15.** 177–188. 1947. [Dept. Agric., Kenya] **100**

Missions introduced wheat into the Kenya highlands at the end of the 19th century. Some years later the early settlers started to grow the crop, mainly Australian varieties such as Gluyas, Thew, and Bobs, and among them was the late Lord Delamere, who was largely responsible for establishing wheat growing. Set-backs by black-stem rust and yellow rust led to the appointment of G. W. Evans as a plant breeder to secure suitable rust-resistant varieties. He was followed in this work by the mycologist, W. J. Dowson, and later G. J. L. Burton. Burton inherited the material raised in the two previous investigations, but many records of the parentage of much of this material was missing, so that the origin of some of the varieties produced from the crosses Burton made with it is unknown.

Wheat is grown in the highlands of Kenya at altitudes between 5,000 and 9,000 ft., with climatic conditions within this range varying from sub-tropical to temperate. The crop is grown in a climate not far from the equator, where there are no marked seasons and where sowing takes place over most of the year. Furthermore, night temperatures are low, and although illumination is intense, days are short, so that growth is slow and spring rather than winter wheat is required. Soil conditions vary considerably, but in general any fertile land will produce good wheat.

The seed rate is commonly about 70 lb. per acre. Wheat in Kenya tillers profusely, and the number of ears to a plant is nearer three than the single ear found in most wheat-producing countries. Cultivations are very similar to those in other countries, and all operations from seeding to harvesting are mechanized. The "combine" is mainly used in harvesting.

An appendix gives the yields and acreages for 1919–38 and for some of the war years. The average yield for the first ten years was 8·4 bu. per acre, and for the second ten years 10·9 bu. When stabilization was reached with about 50,000 acres in 1935, the country was largely self-supporting and did not export. The wheat crop is marketed by a co-operative wheat pool, the industry itself being protected by a heavy tariff on all imported flour.

Kenya wheats may be classed as of moderate quality. Most varieties have a high protein content but have low diastatic power. The *atta* trade is important, i.e. the type of flour used in making *chapattis*, which takes the place of bread in the Indian diet.

Wheats, at whatever elevation they are grown, should possess resistance to stem and leaf rust to which should be added yellow rust at the higher altitudes. The rust problem, breeding for rust resistance, the production of new hybrids, 1921–30, and selections and introduced varieties are also discussed (see Plant Breeding Abstracts).—G. M. H.

MIÈGE, E. Orientation de la céréalculture au Maroc. Céréales. [**Cereal cultivation in Morocco. Cereales.**] *Rev. Bot. appl.* **27ᵉ.** 14–22. 1947. **101**

The paper concerns the areas of cultivation and technique of cultivation of soft wheat, hard wheat, and barley in the native and European parts of Morocco. Cultivation by European methods results in yields double those obtained by natives. The Government of the Protectorate has therefore taken energetic measures to modernize native cultivation of cereals.—D. B.

NEW SOUTH WALES, DEPARTMENT OF AGRICULTURE. **Rice growing in New South Wales.** By *H. J. Dargin.* 1946. pp. 26. **102**

Approximately 30,000 acres on the Murrumbidgee and Benerembah Irrigation Areas are devoted to *Oryza sativa*, which gives good results each year even on the poorest classes of land. Full descriptions of cultural methods are given, and particular attention is drawn to land grading and construction of check banks for efficient irrigation. Two improved heavy-yielding strains, developed from the Caloro rice variety, are suitable for mid- and late-season production. Fertilizing and soil problems are discussed, and methods are suggested for preventing weed infestion, diseases, and other forms of damage.—M. E. E.

ДЖУЛАЙ, А. Продвижение культуры риса в центральные районы СССР. *Соц. сельс. Хоз.* 1946. № 12, стр. 46-50.
Džulaǐ, A. [**Extending the cultivation of rice in the central regions of U.S.S.R.**] *Soc. seljs. Hoz.* 1946. No. 12. 46–50. **103**

At the present time rice is sown in the Soviet Union as far as 47°N. lat., but there is a possibility of extending this cultivation to 50°–53°N. lat. This conclusion is based on the analysis of meteorological conditions in a number of regions during a period of 20–25 years, as well as on the results of experimental sowings made in selected districts. Geographical details are given of locations where the cultivation of rice can be introduced with advantage in the watersheds of the Dnieper and the Volga rivers.—H. F.

Anderson, E. **Corn before Columbus.** *Des Moines, Iowa.* 1947. pp. 24. [Missouri Bot. Gard., Columbus, Mo.] **104**

"There are literally bushels of prehistoric corn cobs already filed away in museums, with occasional perfect ears, and sometimes even tassels, stalks, and leaves. The richest records come from the drier climates such as northern Chile and the Arizona–New Mexico region." This publication is a popular review of the historical evidence from the west coast of South America, the U.S., south-west Mexico, and eastern North America. There is a short bibliography of more technical papers.—R. O. W.

Taylor, D. L. **Growth of field crops in soil treated with chemical growth-regulators.** *Bot. Gaz.* 108. 443–445. 1946. **105**

In two field tests, 2,4-dichlorophenoxyacetic acid (2, 4-D) and isopropyl-N-phenyl carbamate (IPPC) were applied as top dressings in dry form at rates from 1 to 4 lb. per acre on neutral or alkaline loam soils at the start of the growing season. Successive plantings of Red Kidney beans, mustard, wheat, field maize, and sweet maize were made at intervals up to 52 days after the time of treatment of the soil. Desirable control of weeds during the growing season resulted from treatment with 2,4-D, while IPPC did not influence dicotyledonous weeds, and had only slight temporary inhibitory effect on weedy grasses. Activity of the 4-lb. treatment persisted in the soil for some weeks. The treatments slightly prolonged the green condition of kidney beans. The weights of shoots of kidney beans were generally slightly heavier than controls if plantings were made more than four weeks after treating the soil with 2,4-D. Shoots of maize grew more rapidly, and were heavier in soil pretreated with 2,4-D than in untreated soil.—D. B.

Trnka, R., Frantek, Vł, & Praskač, L. Hormonisace a hnojení obchodními hnojivy pšenice, ječmene a ovsa. 1. [**The hormonization and manuring of wheat, barley, and oats with commercial manures.**] *Sborn. čes. akad. zeměd.* **17.** 221–230. [German summary, pp. 229–230.] 1942. **106**

Experiments of this kind were first made in 1941. The influence of the main nutrients (N, P, K) in commercial manures was investigated in addition to hormonization. Natural hormones contained in the urine of bearing cows, as well as artificial hormones (heteroauxins) were tried. The decisive and good effect of N, P and K in commercial manures on yields, quality of crops, and biochemical action during growth and ripening was definite and economical. Manuring with commercial manures with additional hormonization of the seeds was not onesidedly influenced by the hormonization effect.

The vegetative organs of the experimental plants showed a positive effect, and the generative organs very little or no effect of hormonization. Experiments confirmed that the natural source of hormones, namely urine, is in agricultural practice easily obtainable, and more accessible than the expensive, artificial heteroauxines. While the influence of hormones is not fully known, hormonization as a means of increasing agricultural production should not be exaggerated, as it does not replace the influence of nutrients and does not reduce the requirements from commercial manures.—K. A. A.

Elle, Th. Gjødslingsforsøk med tilskudd av bor og mangan til bygg, 1937–39. [**Manurial trials with barley with the addition of boron and manganese.**] *Meld. Stat Forsøksgård Moistad.* 1945. pp. 40–47. 1946. **107**

The report comprises seven trials in manuring of six-rowed barley, partly with and partly without the addition of boric acid and manganese sulphate. The plots were situated on morainic soil comparatively rich in lime. On the average, 3 tons of farmyard manure and 20 kg. calcium nitrate + 30 kg. superphosphate + 10 kg. 40 per cent potash salts gave approximately the same increase in yield (about 50 kg. grain + 100 kg. straw per dekar). Farmyard manure has shown a tendency to give a slightly higher percentage of grain than artificial fertilizers. Manganese appears to have had a slightly positive effect on two fields, and boron on several.—R. P. J.

ФОКЕЕВ, П. М. Способы внесения удобрений под яровую пшеницу. *Бюлл. Инст. Зерн. Хоз. Ю-В. СССР.* 1944. № 3, стр. 18-21.

FOKEEV, P. M. [**Methods of manuring spring wheat.**] *Bjull. Inst. Zern. Hoz. Ju-V. S.S.S.R.* 1944. No. 3. 18–21. **108**

The experiments described show that the yield and quality of the grain and the development of the ear are better as a result of applying some manure in autumn and ploughing it under, and some in spring, than all of it in autumn. The application of manures along the rows or in furrows is likely to be better than if manure is broadcast.—I. Z.

WAGENINGEN, Rijksinstituut voor Rassenonderzoek van Landbouwgewassen, 28ste, 29ste, en 30ste bericht over rassenkeuze (1947). [**28th, 29th, and 30th report on the selection of varieties (1947).**] *Maandbl. LandbVoorl-Dnst.* **4.** 116–125. 1947. **109**

The report is concerned with the performance of different varieties of oats, summer barley, and "transition" and summer wheat which have been under observation at the Netherlands Institute for Agricultural Crop Plant Varieties, Wageningen, where varieties are tested for admission to the official list of varieties. The figures for yield represent in several cases the average for a considerable number of years, and are related to different soil types.—G. M. R.

JOURNAL OF THE MINISTRY OF AGRICULTURE. **Varieties of cereals for spring sowing.** *J. Minist. Agric.* **53.** 474–477. 1947. **110**

The merits of different spring varieties of wheat, oats, and barley are discussed.—M. H.

MILLER, W. B. **Recommended cereal varieties.** *J. Dep. Agric. Vict.* **45.** 63–66. 1947. **111**

Varieties of *Triticum vulgare* for grain are recommended for the Wimmera, Mallee, Mid-Northern, East-Northern, and other districts of Victoria. Pinacle is noted as a Mid-season variety, selected from Pindar, and made available last year. It is highly resistant to flag smut disease, possesses good harvesting characteristics, and produces high quality flour. Bencubbin and Magnet are most suitable as dual purpose hay and grain types.

The main oat varieties in Victoria are Algerian and its improved selection Algeribee, but in the north, where rainfall is often deficient in spring, the earlier Mulga and Dawn varieties are more frequently sown. Cape barley is suitable for feed purposes in all districts, and several varieties are listed for malting.—M. E. E.

THOMAS, I., MILLINGTON, A. J., & CARISS, H. G. **Preparing the farm seed supplies.** *J. Dep. Agric. W. Aust.* **23.** 163–174. 1946. **112**

Wheat, oats, and barley varieties are recommended for the under 14 in., 14–18 in., and 18–20 in. annual rainfall zones of Western Australia. Seeding calendars are given for each zone, covering the recommended early, mid-season, and late varieties and their appropriate planting periods.—M. E. E.

AGRICULTURAL GAZETTE OF NEW SOUTH WALES (THE). **Oats and barley recommendations for 1947 sowing.** *Agric. Gaz. N.S.W.* **57.** 630. 1946. **113**

RAW, A. R. **Some aspects of barley breeding.** *J. Aust. Inst. Agric. Sci.* **12.** 142–144. 1946. [Depart. of Agric., Victoria] **114**

Owing to the extraordinary powers of adaptability exhibited by *Hordeum vulgare* and *H. distichon* as a whole, very little improvement work has been conducted in Australia, and the standard varieties, Prior and Cape, still occupy between 80 and 90 per cent of the country's total acreage. However, there have recently been wide improvements made in the direction of grain quality and yield, and the scope for improvement in regard to malting quality is tremendous. Resistance to covered smut is a problem which requires attention, and other breeding possibilities relate to the development of smooth-awned and awnless barleys, and the production of early varieties for forage purposes. —M. E. E.

SHULL, G. H. **Hybrid seed corn.** *Science* **103.** 547–550. 1946. [Princeton Univ.] **115**

The author reviews his work on *Zea mays*, which he began 41 years ago. He points out that most maize plants are hybrids because they are usually cross-pollinated in the field. The particular significance of "hybrid corn" is the replacement of the haphazard hybridization in the field by completely controlled and selected hybridization of pure lines. Reference is made to the growth of the hybrid seed industry.—D. B.

MINNESOTA AGRICULTURAL EXPERIMENT STATION. Bull. 383. **Maturity ratings of corn hybrids registered for sale in Minnesota in 1944.** By *R. F. Crim, H. K. Hayes, E. H. Rinke, R. E. Hodgson, R. O. Bridgford,* and *R. S. Durham.* 1945. pp. 19. **116**

There is, on page 4, a map of the zones which indicate the approximate number of days growing season which may be expected in the State from emergence after planting to maturity, the stage of being well-dented before a killing frost. There are five zones, with the following gradation in length of season: 82–88, 89–95, 96–102, 103–109, and 110–116 days respectively. Most of the bulletin contains a table indicating how the maize varieties of Minnesota fall within these zones.—R. O. W.

MINNESOTA AGRICULTURAL EXPERIMENT STATION. Tech. Bull. 172. **Experimental study of convergent improvement and back-crossing in corn.** By *H. K. Hayes, E. H. Rinke,* and *Y. S. Tsiang.* 1946. pp. 40. **117**

Primarily a genetical study (see *Plant Breeding Abstracts*) with a section on yield trials of ten double crosses compared with Minhybrid 403.—R. O. W.

IOWA AGRICULTURAL EXPERIMENT STATION. Bull. P84. **The 1946 Iowa corn yield test.** By *C. D. Hutchcroft, J. L. Robinson,* and *F. Reiss.* 1947. 752–804. **118**

Many different hybrids of *Zea mays* were tested in each of twelve districts of the State, and information on yield, stand, moisture, lodging, ear height, and dropped ears is presented for each hybrid tested. Seed was planted at the rate of four kernels per hill in the two northern sections of Iowa and at three kernels per hill in the two southern sections. For each district the entries were ranked on the basis of performance score after all data had been subjected to an analysis of variance and significant differences had been found.—M. E. E.

GEORGIA AGRICULTURAL EXPERIMENT STATION. Press Bull. 578. **Performance of corn hybrids in Georgia.** By *G. A. Lebedeff.* 1947. pp. 3. [Mimeographed.] **119**

In recent years, new hybrids have been developed by neighbouring states, and some of these hybrids were found to be high yielding and better adapted to Georgia conditions. Tennessee hybrids 10 and 15 are well adapted to both Mountain and Limestone Valley sections of Georgia. The Funk hybrids, 713 and 717, compared favourably in yield with that of Neal Paymaster, the best adapted open-pollinated variety. All four hybrids and the Neal Paymaster are, however, subject to weevil injury much more than other varieties in the Piedmont.

The Tennessee and Funk hybrids are found to be not well adapted to the Upper Coastal Plain section, for, although their yields were good in this section, they are very susceptible to weevil and earworm infestation. Whatley Prolific was established as the best corn for the Upper Coastal Plain.—P. M.

САЛАМОВ, А. Б. Межсортовая гибридизация кукурузы. *Селек. Семеновод.* 1947, № 1, стр. 25-31.

SALAMOV, A. B. [**Inter-varietal hybridization of maize.**] *Selek. Semenovod.* 1947. No. 1. 25–31. [North Osetin State Selek. Sta.] **120**

Tables are given in which yields of hybrids are compared with those obtained from both parents in tests made in years ranging between 1931 and 1943.—M. H.

КАЛИНИН, М. С. Гибриды кукурузы. *Селек. Семеновод.* 1947, № 1, стр. 22-4.

KALININ, M. S. [**Hybrid maize.**] *Selek. Semenovod.* 1947. No. 1. 22–24. **121**

Improved yields are obtained when crosses in *Zea mays* are made between plants belonging to different botanical groups. Adaptation of the hybrids to the varied conditions in U.S.S.R. is recorded.—M. H.

LUDBROOK, W. V. **A yield trial of top crosses between a Victorian strain of Funk's Yellow Dent maize and twelve American inbreds.** *J. Aust. Inst. Agric. Sci.* **12.** 139–141. 1946. [Div. Plant Industry, C.S.I.R., Canberra] **122**

Top crosses from an open-pollinated strain of Funk's Yellow Dent *Zea mays* and each of twelve American inbreds were grown during 1945–46 on well-fertilized plots at Canberra. The plots were irrigated whenever necessary, at first by sprinkling and later (when the plants exceeded 2 ft. in height) in furrows. Only two of the inbreds, K4 and 38–11, produced top crosses that gave substantial increases in grain yield as compared with the controls. Their yields were 144·3 and 130·7 bushels per acre respectively, taking bushel weight to be 56 lb. The possibilities of using these and other top crosses to replace the single or double cross hybrids at present used in the maize-growing areas of Gippsland are discussed.—M. E. E.

LOMA, J. L. DE LA. ¿ Que es el maíz híbrido ? Sus ventajas y limitaciones. [**What is hybrid maize ? Its advantages and limitations.**] *Tierra, Mexico.* **1.** 527–530 and 570–571. 1946. [Prof., Escuela Nac. Agric., Mexico] **123**

The article is concerned mainly with the breeding of *Zea mays*. The use of bred strains would enable the Mexican farmer to produce yields approximately 20 per cent greater than those he now gets, but a difficulty is the fact that he must purchase his seed afresh each year, for if he takes his seed from each year's crop in the normal way, degeneration would set in. A necessity exists for the organization of reproduction and distribution of the hybrid strains.—G. M. R.

LANGHAM, D. G., GORBEA, O., VILLANUEVA, O., & ROJAS, C. El maíz en Venezuela y su mejoramiento. [**Maize in Venezuela and its improvement.**] *Cuad. verd.* **21.** 1945. pp. 59. [Received 1947.] [Dept. Genet., Inst. Exp. Agric., Min. Agric., Venezuela] **124**

Venezuelan indigenous varieties of *Zea mays* are described. They are mostly of the tropical flint type, but vary in accordance with locality. Efforts are being made to use their best characters in the breeding now in progress. Since 85 per cent of the country's maize is grown by smallholders and shifting tenants, technique is generally primitive. Cultural methods and different times of sowing are described, as are the various ways in which the storage problem is commonly solved.

Breeding was initiated by the Department of Genetics in 1939, and simultaneously educational work aiming at the improvement of cultural methods was set on foot. Trials of 245 varieties (listed), including the indigenous varieties, have left a material comprising 700 pure lines. Mass selection has been employed, and by this means from yellow Cuban maize (a mixture of two varieties) the strain Venezuela-1 has been obtained. Hybridization on a large scale began in 1941. The performance of the hybrids is described and tabulated. Two further varieties have been produced, namely Venezuela-2, a sweet corn for the table obtained first by selection and then by crossing with Venezuela-1, and Venezuela-3, a white-grained selected variety. Multiplication of these varieties is entrusted to progressive farmers, distribution is through the Department of Genetics.

Educational work embraces experiment plots (seeding rate, planting distance) and demonstration sowings (check-row system) in various parts of the country.—G. M. R.

MARINO, A. E., & LUNA, J. T. Dos híbridos comerciales de maíz. Resultados de ensayos. [**Two commercial hybrids of Zea mays. Results of trials.**] *Rev. argent Agron.* **14.** 50–60. 1947. [Inst. Exp. Invest. Agric.-Ganad., Santa Fe, Argentina] **125**

The double hybrid, Colorado Santa Fe No. 3, the genetical history of which is presented, was tested (1945–46) in eight different localities in comparison with seven varieties and with the hybrid Colorado Klein, the following results being obtained :—

	Mean yield quintals per hectare.	*Mean weight of cobs in grm.*
Col. Santa Fe No. 3	39·3	128
Col. Klein ..	29·9	94

In four years' trials at Angel Gallardo, the hybrid Colorado Santa Fe No. 2, from Colorado Klein × BVIIm3, excelled the same control by 45 per cent, but in trials conducted in seven localities in 1945–46 its superiority was not so marked, although it still excelled the control.—G. M. R.

BASCIALLI, P. C. Características agrícolas de las variedades comerciales de maíz. [**Agricultural characteristics of the commercial maize varieties.**] *Granos.* **10.** Nos. 4–6. 39–43. 1946. [Div. Prod. Granos., Min. Agric., Argentina] **126**

Eighty per cent of the Argentine maize crop is, under normal circumstances, exported to Europe. The remainder is used at home for fodder, silage, and occasionally as a vegetable. The exported grain is the hard type of maize, known in Argentina as "export type." The various Argentine types are classified according to (1) the external appearance of the grain, and (2) the duration of the growth period from sowing to maturity (< 100 days in very early, 100–120 days in early, 120–140 days in medium early, 140–160 days in late, and > 160 days in very late varieties). Finally, a short description is given of some of the principal commercial varieties, with notes on the areas in which they are grown. An interesting type is the so-called "bitter" maize, which is resistant to locust attack. The bitter varieties have unfortunately degenerated through lack of selection and because of adulteration and hybridization, and the resistance noted is therefore frequently absent. Their chief disadvantages are their lateness (150 to 180 days from sowing to maturity) and they are of a bunchy growth habit which impedes cultivation and harvesting.—G. M. R.

ÅKERMAN, Å. Svalöfs Orionhavre III. (01331). **[Svalöfs Orion oat III. (01331).]** *Sverig. Utsädesför. Tidskr.* **57.** 105–109. [English summary, p. 108.] 1947. **127**

The oat was marketed in 1946. It is a cross between Golden Rain I and Orion II. While losing only one or two days in time of ripening, Orion III represents an improved Orion type with stiffer straw, a decidedly higher grain quality, and some higher grain yield. The new variety is not to compete with Same oats for the northernmost part of Sweden, but is adapted to the milder regions.—M. H.

ÅSANDER, F. Havreförsök vid Sveriges Utsädesförenings Jämtlandsfilial 1918–45. **[Oat trials at the Jämtland Branch Station of the Swedish Seed Association, 1918–45.]** *Sverig. Utsädesfören. Tidskr.* **56.** 148–158. 1946. **128**

Among the oat varieties at present available for Jämtland agriculture, Orion II and Same are outstanding when it is intended to harvest the crop ripe. Orion II has been grown in the area for several years, during which time it has proved reliable in cultivation and has become increasingly popular. Same oats, placed on the market in 1943, may be considered as competing with Orion II. A comparison which Professor Åkerman made recently regarding the cultivation value of Same oats shows that on the average of 17 local trials in the province of Jämtland during the period 1938–43, it gave a grain yield 220 kg. per ha. higher than that of Orion II (or 8·6 per cent). The average yield of straw in these trials was, on the other hand, slightly lower in Same than in Orion II, namely 5367 kg. per ha., compared with 5583 kg. in Orion II. At Gisselås Experiment Station the increased yield of grain on the average of five trials during five years amounted to 736 kg. per ha., or 28·6 per cent. The comparison shows further that Same, on the average of 110 trials in the four most northerly provinces, has given 9·2 per cent higher grain yield than Orion II.—R. P. J.

ÅKERMAN, Å. Redogörelse för förädlingsarbeten på Svalöf med extremt tidig svarthavre. **[A report on the breeding work at Svalöf with extremely early black oats.]** *Sverig. Utsädesför. Tidskr.* **57.** 110–128. [English summary, pp. 126–127.] 1947. **129**

Four different types of *Avena sativa* are grown in Sweden. In the northern area the type used has a black hull and ripens within 85 to 90 days of sowing. In breeding work it has been necessary to consider the specific demands of north Swedish agriculture, and the work has been transferred from the main station at Svalöf to the northern branch stations. The Same oat (from Sv 25/356 × Orion II) is considered the best for the northern regions of Sweden.—M. H.

ALPWIRTSCHAFTLICHE MONATSBLAETTER. Une variété d'avoine pour la montagne. **[A variety of oats for the mountains.]** By *J.A.* and *J.Z.* *Alpw. MBl.* **81.** 122–124. 1947. **130**

In northern Europe the short growing season is to some degree compensated by very long days. In the mountains of Switzerland relatively short days accompany a short growing season, and a marked degree of earliness is requisite in cereals. The variety Soldanelle has been produced at the Mont Calme Experiment Station, Lausanne, from descendants of the hybridization in 1913 of an early foreign variety named Dorbeney and an indigenous oat named Bonzon.

Soldanelle ripens approximately eight days sooner than the earliest of other oat varieties. In long-duration trials at altitudes of 1200 and 1000 m. the average yield has exceeded 28 quintals grain and 48 quintals straw per hectare. —G. M. R.

STANTON, T. R. **Oat crops in demand: improved varieties.** Land Policy Rev. **10.** 17–19. 1947. [U.S. Dept. Agric., Beltsville, Md.] **131**

A brief popular account of the achievements of the plant breeders in the Department of Agriculture and the States.—R. O. W.

AGRICULTURAL GAZETTE OF NEW SOUTH WALES (THE). **Seed oats for 1947 planting.** *Agric. Gaz. N.S.W.* **57.** p. 624. 1946. **132**

"Owing to extreme shortage of oat grain and in order to preserve varieties and strains best suited to New South Wales conditions, an emergency plan to purchase and distribute seed oats for 1947 planting has been formulated. Maximum price to grower has been fixed, and the Prices Commissioner will take special action to ensure that these regulations are complied with."—Quotation.

ELDER, C. R. **These "Clinton-like" oats?** *Iowa Fm Sc.* **1.** 15–16. 1947. **133**

A warning is given against paying high prices for oat varieties sold under trade names as Colo, Bond Cross, Bond Hybrid, McCarty, and D 69 × Bond, which are claimed to be superior to Clinton; Clinton oats are being made available to Iowa farmers now for the first time. A table showing comparisons for lodging and test weight is included.—R. O. W.

PORTÈRES, R. La variation comparée dans les espèces *Oryza sativa* L. et *O. glaberrima* Steud et l'origine hybride intrajordanienne de la plupart des formes cultivées de la première espèce. [**Comparative variation in the species *Oryza sativa* L. and *O. glaberrima* Steud and the intervarietal hybrid origin of the greater part of the cultivated types of the former species.**] *Rev. Bot. appl.* **27.** 151–155. 1947. **134**

Oryza sativa is a native of Asia and *O. glaberrima* of Africa. *O. sativa* appears to be of polyphyletic origin, and in it one finds more variation than in *O. glaberrima*. The species are distinguished by the following characters: *O. sativa* has a long and sharp-pointed ligule and a supple panicle axis; in *O. glaberrima* the ligule is truncated and short and the panicle axis is stiff.—D. B.

CHEVALIER, A. Le rendement des rizières africaines. [**Yields of African rice fields.**] *Rev. Bot. appl.* **27.** 243–244. 1947. **135**

Figures are produced to show that rice yields can be as high as 20 quintals per ha. (instead of 5 to 10) if selected seed of suitable varieties is used and if cultivated under modern improved methods. Varieties of the Asiatic *Oryza sativa* are superior to those of the African *O. glaberrima*. One of the most urgent tasks is the destruction of *O. barthii* which invades the ricefields.—D. B.

LJUNG, E. W. Sveriges Utsädesförenings rågförädlingsarbeten. [**Work in rye breeding conducted by the Swedish Seed Association.**] *Sverig. Utsädesfören Tidskr.* **54.** 295–315. 1944. **136**

Paper read at the annual conference of the Swedish Seed Association, 20th July, 1944. The reasons for the decrease during the last few decades in the cultivation of rye and the increase in the area under wheat are discussed. The methods and aims of the Seed Association in its rye breeding work are described, also the most important varieties which have been placed on the market.

Among the breeding material are some varieties (not yet named) which it is hoped to hand over for general cultivation, and which are therefore undergoing further testing. These include a new line, 0302e, from Steel rye, which in trials at Svalöf has given a slightly higher average yield than Steel: the variety 0801b, from the cross Star rye × 0280 (from Prof. Heinrich rye), a stiff-strawed variety with uniform and high grain yield; a high yielding line, labelled *b*, from the cross Steel rye × 0280, unfortunately with rather long straw; the variety Sv 36/28, from the cross Malm rye × Finnish rye, with considerably higher grain yield than both parent varieties; the variety 0460, from the cross Steel rye × 0590 (from Midsummer rye) with good grain yield but rather weak straw.

The chief aim of future breeding is the production of varieties equal to King rye II in stiffness of straw, but with an even higher yield of grain; of varieties less susceptible to drought than those now available, and with late germination ripeness; of very hardy varieties for Norrland, with stiff straw and high grain yield.—R. P. J.

LJUNG, E. W. Råg. [**Rye.**] *Sverig. Utsädesfören. Tidskr.* **56.** 255–260. 1946. **137**

From the figures for grain yield in the Seed Association's trials at Svalöf during the last 25 years, it is seen that autumn wheat and autumn rye on the relatively stiff and good soils there have given broadly speaking the same yield. At the Branch Stations results were slightly different: wheat and rye varieties were approximately equal at Ultuna, while on the contrary Sun wheat gave a slightly higher yield than Steel rye and Petkus at the Kalmar-, Östgöta-, and Västgöta Branch Stations.

Results of comparative trials (177) with autumn rye and autumn wheat conducted during the period 1929–40 by the Institute for Agricultural Research show that on the average of all the trials the yield was about the same for wheat and rye. Arranging the trials according to kind of soil, it was found that wheat gave c. 12 per cent more than rye on clay soil and rye c. 8 per cent more than wheat on sandy soil. It should be observed that of the 12 experiment years, only one, 1939–40, had a severe winter.

The varieties of rye generally grown in south and central Sweden proved to be sufficiently winter-hardy in those parts of the country. In Norrland, in some years, the varieties usually grown in more southerly parts gave good results, but in other years they suffered injury during the winter and spring. From observations made, these injuries were due not only to the low temperature but also to attack by certain plant diseases. Local breeding of autumn rye is necessary for Norrland.

In grain-yielding capacity, Steel rye and King rye II, Petkus rye and Petkus rye II, together with Agro rye, have been about equal. Arranging the experimental results with regard to climate, soil, and different weather conditions it has, however, been demonstrated that Steel rye and King rye II are superior on relatively good soil and with a normal supply of moisture, while the three others have given the best results on dry soil during dry years and in south-east Sweden, where the climate is relatively dry.

As a result of crosses, a large number of lines has been obtained, some of which have proved to be so valuable in trials that the question of their distribution is being considered. Among these may be mentioned the varieties: 0801 b, from the cross Star rye × 0280 (from Prof. Heinrich rye), a stiff-strawed variety with high and uniform grain yield; Sv 36/28 from the cross Malm rye × Finnish rye, with a considerably higher yield than both parent varieties; 0460, from the cross Steel rye × 0590 (from Midsummer rye), with good grain yield but rather weak straw.

At the Västernorrland Branch Station, by crossing Improved Wasa rye II and the Finnish variety Härmä rye a new variety, Björn rye, has been produced: in trials in Norrland it showed good winter-hardiness and relatively high yield, and has been released for general cultivation.—R. P. J.

TEXAS AGRICULTURAL EXPERIMENT STATION. Progr. Rep. 990. **Grain sorghum yields.** By *J. R. Quinby*. 1946. pp. 3. **138**

Report of yield trials with many varieties (mostly suitable for combine harvesting) of a crop of great importance as animal feed in Texas, where the 1944 production of 97 million bushels of grain exceeded that of maize, wheat, or any other cereal.—R. O. W.

THOMPSON, E. G. **Spring wheat.** *J. Minist. Agric.* **53.** 423–425. 1947. [Nat. Inst. Agric. Bot., Cambridge] **139**

There is discussion of winter varieties, early and late-maturing spring varieties, and a comparison of spring and autumn wheats. The suitable choice of any crop is a question of reconciling the characters of the varieties to the conditions of particular fields or farms.—M. H.

BERG, S. O. Weibulls Kärnvårvete. Ny högavkastande tidig sort med utmärkt Kärnkvalitet. [**Weibulls Kärn spring wheat. New high yielding early variety with excellent grain quality.**] *Weibulls ill. Årsb.* 1945. 20–22. **140**

In the spring of 1946 a new variety of spring wheat, Weibulls Kärn, will be put on the market. It has been bred from a cross between two numbers, 8244 from Extra Kolben × Halländ spring wheat, and 8388 from Marquis × Hâtive inversable.

Kärn is intended to compete with Diamant wheat II, and has proved distinctly superior to that variety in some respects. It has been tested at Weibullsholm since 1938 and has been included in 45 official trials during the three-year period 1942–44. The latter trials have been distributed in the various spring wheat-growing provinces from Scania in the south to the province of Stockholm. Kärn has throughout given a higher yield of grain than Diamant wheat II. Its superiority in the trials at Weibullsholm amounted to 3 to 4 per cent, and in the official trials it was no less than 5 per cent. It may be added that in the same number of official trials it also gave a 2 per cent higher grain yield than Fylgia wheat, in 35 official trials it surpassed Progress wheat by 7 per cent, and in 26 trials it surpassed Atle by 9 per cent. In 44 official trials Kärn gave as high a grain yield as Brons wheat, and possesses the advantages of slightly earlier ripening and decidedly better baking qualities.

The straw of Kärn is of medium length and very stiff, decidedly stiffer than in Diamant wheat II and Fylgia, but not quite so stiff as in Atle and Progress. On the average, Kärn comes into ear one or two days earlier than Diamant II; both varieties have ripened at the same time.—R. P. J.

ÅKERMAN, Å., & MACKEY, J. Vårvete. [**Spring wheat.**] *Sverig. Utsädesfören. Tidskr.* **56.** 232–235. 1946. **141**

During the time that plant breeding has been in progress in Sweden there has been a considerable increase in spring wheat cultivation. At present about 75 per cent of the spring wheat area is sown with Diamont wheat II. To the same class of earliness belongs the variety Svalöf Fylgia placed on the market in 1934. It possesses a higher specific yielding capacity than Diamont II, and can, particularly under favourable conditions, give a considerably higher yield. Under more severe climatic conditions this difference is evened out. Fylgia is especially valuable for east Sweden. That it is not more generally grown is due to its poor baking qualities.—R. P. J.

ÅKERMAN, Å., & MACKEY, J. Höstvete. [**Autumn wheat.**] *Sverig. Utsädesfören Tidskr.* **56.** 226–231. 1946. **142**

Among the results of breeding work conducted during the last decade which are of the greatest interest to-day, Skandia wheat stands out as one of the most valuable. Skandia II is, however, not so hardy as Äring II, but a more hardy Skandia wheat has been obtained in Skandia III. Of interest, too, is the new Hansa wheat from Sun III × Standard.

In the breeding of autumn wheat for central Swedish conditions, winter-hardiness is a very important desideratum. In addition to Borg, the varieties which are of interest for Svealand are, in particular, the two Weibull varieties, Ergo and Virtus, and the Svalöf varieties Thule III, Gluten, Pearl wheat I and II, and also Svea II.

The severe winters 1940–42 were very valuable from the point of view of breeding. Among the hardy lines, two combined hardiness and high yield in an excellent manner. Of these, 01392 b_2, from Ergo × Gluten, bred at the Ultuna Branch Station, has up to the present given a 7·9 per cent higher yield than Ergo (12 trials) and 01420, from Skandia × Sv 36/175 (a high-yielding, hardy land wheat line from Västergötland) has given 4·6 per cent more than Ergo (9 trials).

For Värmland and neighbouring regions with more severe conditions, Pearl (put on the market in 1938), an early wheat from the cross 0912 (sister variety of Sun III) × Svea, constitutes a great improvement in yield and stiffness of straw compared with Svea wheat previously grown in these regions. The sister variety, Pearl II (released in 1946), represents a further advance in this respect. Quality breeding of autumn wheat is based partly on lines from Swedish land wheats, partly on foreign high-standard wheats.—R. P. J.

BERG, S. O. Nya resultat av veteförädlingen vid Weibullsholm. **[Recent results of wheat breeding at Weibullsholm.]** *Weibulls ill. Årsb. No.* **39.** 22–23. 1944. **143**

Autumn wheat: Weibull's Virtus wheat (a line from a cross Ergo × Svea II, which, under the number W.8739, has been tested in trials since 1939) is to be placed on the market in the autumn of 1945.

The excellent winter-hardiness of this variety was first shown after the severe winter of 1939–40, partly in special hardiness trials at Hallandsåsen and partly in comparative yield trials at Weibullsholm. This quality was even more evident in trials in different parts of Sweden after the winter of 1941–42. In northwest Scania then the temperature fell to —30 degrees. In the trials at Weibullsholm all the south Swedish varieties of autumn wheat were completely killed by frost, while Ergo was thinned out to such an extent that many fields had to be ploughed up and resown in the spring. Virtus wheat suffered only slight injury, and, on the average of three different trials, gave a grain yield of 4,470 kg. per ha., the corresponding figure for Ergo being 910 kg.

Results from ten trials in 1943, when the different degree of hardiness of the varieties owing to the mild winter did not affect the yield, would appear to indicate that the new variety also possesses high specific grain yield, quite as high as that of Ergo wheat.

Spring wheat: Weibull's Brons wheat is to be placed on the market in the spring of 1945. It has been produced from the cross Aurore × Extra Kolben II. Results of a large number of trials show that in grain yield it is superior to such varieties as Extra Kolben II, Atle, Diamant II, and Fylgia, and has given quite as high an average yield as Progress spring wheat. Brons wheat is decidedly earlier in ripening than Progress. It is also characterized by relatively short and stiff straw, stiffer than in Diamant II and Fylgia, but not quite so stiff as in Atle and Progress. As regards baking quality Brons wheat is considered equal to Extra Kolben II, and thus not in the best class of all, to which Atle belongs. Brons wheat is recommended primarily for the lowland areas in Götland.—R. P. J.

UGESKRIFT FOR LANDMAEND. Forsøg med Hvedesorter, 1943–46. **[Trials with wheat varieties (in Denmark), 1943–46.]** *Ugeskr. Landm.* **92.** 589–590. 1947. **144**

The trials were carried out at seven of the State Experiment Stations. In 1943, owing to scarcity of seed, they were conducted at four Stations only.

Five varieties were included in all the trials and the yield of the varieties which were tested in a smaller number of trials was calculated in proportion to the average yield of these five :—

	No. of trials	*Hkg. Grain. per ha.*	*Relative No. Grain.*	*Relative No. Straw.*
Pajbjerg Ideal ..	28	44·0	102	99
Øtofte Nr. 3 ..	28	43·9	102	101
Svaløf Skandia II ..	28	43·3	101	104
Weibulls Æring II	28	42·4	99	100
Øtofte Nr. 103 ..	28	41·4	96	97
Svaløf 01157 B ..	27	45·5	106	104
Abed Nr. 32 ..	18	45·0	105	103
Weibulls 6590 ..	16	46·0	107	102
Jubilé	16	45·3	105	97
Pajbjerg Konge II ..	16	44·3	103	94
Joncquois	16	41·1	96	85
Lawaetz Als ..	12	42·7	99	104
Abed Borg ..	10	44·5	103	101
Weibulls Eroica ..	10	47·0	109	104

It was not possible to determine the winter-hardiness of the varieties during the years when these trials were in progress, but from observations made on trials in 1941 and in 1946–47 they can be placed in the following order for this character: Weibulls Eroica, Weibulls Æring, Svaløf 01157 B, Svaløf Skandia II, Øtofte 103, Øtofte 3, Weibulls 6590, Pajbjerg Ideal, Lawaetz Als, Abed Borg, Abed 32, Pajbjerg Konge II, Jubilé, and Joncquois.—R. P. J.

МАМОНТОВА, В. Н. Сорта яровой пшеницы Института Зернового Хозяйства Юго-Востока СССР. *Соц. Зерн. Хоз.* 1946. № 2-3, стр. 23-34.

Mamontova, V. N. [**Varieties of spring wheat at the Institute of Grain Husbandry, S.-E. U.S.S.R.**] *Soc. Zern. Hoz.* 1946. No. 2–3. 23–34. **145**

Work on spring wheat at the Institute covers 35 years. The studies may be divided into periods which include: 1911–18 (selection for drought resistance and high yields); 1918–26 (selection for grain quality); 1927–33 (an extension of hybridization methods); and 1934 to the present time, in which period study has been concentrated on greater production, influence on growth of climatic and edaphic factors, early ripening, etc. The characteristics of many varieties are discussed.—M. H.

МОСОЛОВ, В. П. Подзимний посев озимой пшеницы. *Доклады Всесоюз. Акад. С.-Х. Наук* 1946. № 11-12, стр. 3-16.

Mosolov, V. P. [**Late autumn sowing of winter wheat.**] *Doklady Vsesojuz. Akad. S.-H. Nauk* 1946. No. 11–12. 3–16. [All-Union Acad. of Agric. Sciences, Moscow] **146**

A description is given of the exploratory experiments undertaken in Eastern Siberia between 1941 and 1944. These were made imperative in war-time by the urgent necessity of enlarging areas under wheat crops in eastern regions of the U.S.S.R. The best results were obtained with wheat sown between 11th and 25th October, in Siberia, and between 17th October and 10th November in the European part of the U.S.S.R. Although winter temperatures in some years of the experimental period were as low as –41·5°C., wheat crops were not appreciably affected either by frosts or by the absence of snow in certain localities. The development of wheat was directly influenced by meteorological conditions prevailing in the spring of the following year. Early phases, from shooting to tillering, required 20–30 days; those from tillering to ear setting, 29–44 days; and those from ear formation to waxy ripeness, 37–49 days. The total vegetative period was 10–15 days longer when the spring was late and cold. Yields were fairly stable and varied according to the time of sowing (from 10·6 to 24·4 centners per ha.), early sowings made between 16th and 20th October producing usually greater yields. The stands were fairly dense (76–118 cm. high), having 260–369 productive stems per sq. m.—H. F.

Agricultural Gazette of New South Wales (The). **Varieties of wheat recommended for 1947 sowing.** *Agric. Gaz. N.S.W.* **57.** 626–630. 1946. **147**

Pugsley, A. T., & Hockley, S. R. **Wheat variety and crossbred trials at Pallamana, 1944-46.** *J. Dep. Agric. S. Aust.* **50.** 289–291. 1947. [Waite Agric. Res. Inst.] **148**

All the new wheats released during the past years for South Australian conditions possess high yielding ability, which has often been combined with rust resistance and good baking quality. During these trials, Bencubbin and Ranee varieties of *Triticum vulgare* were used as standards for comparison. Gabo and Warigo returned the highest average yields of 17·5 bushels and 16·1 bushels per acre respectively, with Bencubbin third with an average of 13·0 bushels per acre. Warigo is now well established throughout the wheat belt of the State, and Gabo should prove popular as an early variety when adequate seed supplies become available. Several crossbred strains showed considerable promise, and it is interesting to note that, although varietal differences in yield were small during the two dry years, yields of the new varieties were substantially higher than those of Bencubbin and Ranee in the third year of more than average rainfall.—M. E. E.

Uruguay, Ministerio de Ganadería y Agricultura, Dirección de Agronomia. Pub. No. 89. Cultive trigo forrajero (sustituyendo en parte a la avena). [**Grow forage wheat in part replacement of oats.**] Montevideo, 1947. pp. 8. **149**

Wheat consumption is on the increase in Uruguay, but the 1947 harvest is expected to be 110,000 tons short of the normally required 350,000 tons. It is hardly possible for the Uruguayan farmers specializing in cropping to increase their present wheat areas, and an appeal is made to ranchers, who are accustomed in any case to grow cereal leys for grazing, to replace some of the more commonly grown oat leys by forage wheat. The variety Klein 157 is recommended. Forage wheat gives excellent grazing for half a year (April to the end of August), but subsequently also, if care is taken to avoid excessive trampling, a crop of over 600 kg. grain per ha., saleable at a Government guaranteed price. Wheat is less susceptible than oats to the prevalent pest of cereals, *Toxoptera graminum.* Information is given on the variety recommended, on cultural methods, and on the management of grazing.

A note on the biological control of *Toxoptera graminum* is appended by the Entomological Laboratory of the Ministry. Farmers are advised to sow a trial area of 20 to 100 sq. m. with the cereal to be grown, in order to ascertain that the appearance of the pest is closely followed by that of its natural aphid parasite [*Aphidius platensis ?*].—G. M. R.

Boerger, A. Las perspectivas del cultivo triguero en el Brasil. [**Wheat-growing prospects in Brazil.**] *Arch. fitotéc. Uruguay.* **3.** 239–261. [English and German summaries, pp. 258–261.] 1940–41. [Received 1947.] [Director, Inst. Fitotécnico "La Estanzuela" and President, National Commission For. Problem, Uruguay] **150**

In an address delivered to a Congress of Agronomists in the south of Brazil, reference is made to certain years calamitous for wheat production in different parts of the world, including the River Plate region (1939–40) and Rio Grande do Sul, the southernmost Brazilian state (1820–21). The effect in Rio Grande do Sul was the complete disappearance, a century ago, of its once flourishing wheat production. Yet "the mission of making the sowing of wheat advance in the direction of the Equator is incumbent on the United States of Brazil". Aids to the fulfilment of this mission are discussed. Genetic work will always be decisive. Certain Uruguayan and Argentine strains would be of value for direct use or as breeding material, and Brazilian bred strains that have already appeared are of great importance. Vernalization, in its application to genetical work, may possibly be of use (see work by Canel in Uruguay, *Herb. Abstr.* 8, Abs. 1353). Cultural methods are at present of less significance, but an essential is organization for the distribution of selected seed.—Author's summary.

Edinburgh and East of Scotland College of Agriculture. Bull. No. 1. **Economic aspects of farm mechanization: Report No. 3. Combine harvesters in east and south-east Scotland, 1945.** By *D. Witney* and others. 1946. pp. 44. **151**

Combine harvesters have only recently become prominent in Scotland, even in the more favoured arable-farming districts of the east and south-east, where large acreages of wheat, barley, and oats are grown. This is a detailed review of their use, performance, and costs of operation, with sections on grain-drying and the disposal of straw. In addition to the crops above, the combine was used to harvest beans and cocksfoot for seed (see also *Herb. Abstr.* 17, Abs. 297).—R. O. W.

Edinburgh and East of Scotland College of Agriculture (Department of Economics). Bull. No. 8. **Economic aspects of farm mechanization. Combine harvesters in east and south-east Scotland, 1946.** By *H. Christine McIver.* pp. 13. [Mimeographed.] **152**

Combine harvesters can work better during a dry harvest, but it is during a wet harvest, such as the 1946 harvest, that they really prove invaluable. During 1946 they were the means of saving hundreds of acres of grain drying and storage; combine harvesters and binders are complementary. The amount of grain harvested by each method varies to a certain extent according to the weather at harvest time. Despite these problems, combine harvesters have certainly gained a firm foothold in Scotland which, with the present labour shortage, will most likely be strengthened in succeeding years. —Author's conclusion.

Hine, H. J. **Efficient threshing.** *J. Minist. Agric.* **54.** 205–208. 1947. [Min. of Agric. and Fishs.] **153**

The adjustments to threshing outfits that are necessary to get good grain samples, to deal efficiently with the straw and to dispose of the cavings and weed seeds are given.—G. M. H.

Cashmore, W. H. **Harvesting in bad weather.** *J. Fmrs' Cl. Lond.* Part I. pp. 12. 1947. **154**

A discussion of modifications to binders for dealing with flattened or laid corn, of windrowing, direct combining, and wind ricks.—M. H.

India, Proceedings of the Society of Biological Chemists. **Symposium on "Preservation and processing of food grains."** *Proc. Soc. Biol. Chem.* **5.** pp. 26. 1946. **155**

Contains articles by K. V. Giri on fortification of food grains, B. Krishnamurty on insects in relation to preservation, S. S. De on processing of foodstuffs, and A. V. Varadaraja Iyengar on inert dust treatment.—R. O. W.

Whitehouse, J. **A thresher for individual plants.** *Sci. Agric.* **27.** 110–111. 1947. [Univ. Saskatchewan, Sask.] **156**

The machine, which is a modification of the Harrington single plant thresher, is described and illustrated. It handles wheat, oats, barley, rye, and flax satisfactorily. This machine can thresh as fast as single plants can be inserted and the grain pan emptied. Single heads have been threshed at the rate of 350 per hour by one person.—D. B.

BIRKHEAD, J. W., & PETERS, J. H. **Two-thirds of small grains combined.** *Agric. Situation.* **31.** 9–10. 1947. [Bur. Agric. Econ., U.S. Dept. Agric.] **157**

Two-thirds of the total output is now combined, thus making it possible to economize on labour. In 1945, combines were used to harvest the following percentages of crops: wheat 80, oats 40, barley 65, rye 50, flax 60, buckwheat 35, and rice 40. Most combining is done from standing grain, but combining from the windrow is important in certain States. The binder-thresher method is still used when straw is required for fodder or bedding.—R. O. W.

KANSAS AGRICULTURAL EXPERIMENT STATION. Tech. Bull. 60. **Effects of rain on wheat during harvest.** By *C. O. Swanson.* 1946. pp. 92. **158**

The study is concerned with changes which take place in wheat between the time it has matured in the field and the time it is placed in the bin. The measures and indexes used were: test weight, grain grading including external vitreous appearance, internal texture of endosperm, percentages of flour yield, baking values, mixing properties. Wheat, of which the commercial grade is lowered from wetting by rain after it is once dry enough to cut with the combine, has lost none of its milling and baking values (provided no sprouting has occurred).—R. O. W.

MENDES, C. T. A colheita do milho. [**Harvesting maize.**] *Rev. Agric., Piracicaba* **22.** 147–153. 1947. [Prof., Luiz de Queiroz Agric. Coll., Univ. S. Paulo, Brazil] **159**

In a series of experiments, the following two methods of harvesting *Zea mays* were compared: (1) the "ordinary," in which the grain is allowed to become quite ripe without, however, being excessively dry, the cobs, and only the cobs, being then harvested by hand; and (2) the "American," in which the whole plant is harvested by means of a binder when the grain has passed the milk-ripe stage but is still sufficiently tender to be pierced with the finger nail. In this process the sheaves are left standing in stooks until the grain has fully matured, which happens in 30 to 40 days; the cobs can then be separated from the haulms and leaves, and these in turn become available for animal feed. The value of this feed probably makes process (2) economical in countries with severe winters, but in the Brazilian region concerned the maize haulms and stems have proved unpalatable to animals (horses, mules, cattle) whether fed alone or in a mixture, and the process offers no advantage over method (1).

Table 1 gives the figures for grain yield in two hard-grained maize varieties harvested by the two processes in three experiments, having 6, 10, and 7 replications respectively. The American process did not result in increased production but in a slight diminution, which may, however, be partly due to the heterogeneous nature of the Brazilian maize varieties making it practically impossible to harvest when all the plants have reached the right stage of maturity. Table 2 gives, in somewhat more detail, figures for a similar experiment in which two soft-grained and one hard-grained variety were used. Grain weight per hectolitre was greater in the maize harvested by the ordinary process. The soft-grained varieties were more susceptible than the hard-grained to the depressing effect of the American process, which is apparently prejudicial to the translocation of matter from the haulms to the cobs.—G. M. R.

MANCHESTER UNIVERSITY, FACULTY OF ECONOMIC AND SOCIAL STUDIES (AGRICULTURAL ECONOMICS DEPARTMENT). (Shropshire and Staffordshire Area.) **Barley costs and returns. 1946 crop.** 1947. pp. 7. [Mimeographed.] **160**

Thirty farmers co-operated in the scheme, 21 using binders, 14 using combines, and five using both methods in the harvesting of their crops. Although poor weather conditions prevailed during the harvest, returns were good. Only three farms made net losses, all due to low yields resulting from difficult harvesting. The acreage yield was well above the national average.

Average net profit per acre from binder-harvested grain was £15 4s. 6d., and from combined grain £17 1s. 11d. The average net profit per acre for the 30 farms was £16 6s. 3d. —P. M.

READING UNIVERSITY DEPARTMENT OF AGRICULTURAL ECONOMICS. Misc. Cost Stud. No. 8. **Costs and returns from barley production in the southern province in 1945.** By *G. B. Bissett* and *L. G. Bennett.* 1946. pp. 3. [Mimeographed.] **161**

Yields averaged 4·3 quarters per acre. Returns per acre ranged from £16 19s. 1d. to £30 16s. 11d., with average at £22 7s. 0d. Average costs of production were £13 13s. 1d. (labour 44·5 per cent, seeds, etc. 36·5 per cent, rent and overheads 19·0 per cent). Over-all average surplus was £8 13s. 11d. per acre.—R. O. W.

Edinburgh and East of Scotland College of Agriculture (Economics Department). Farmers' Leafl. No. 3. **1946 crop costs studies (contd.). II.—Oats,** by *H. Christine McIver.* **III.—Potatoes,** by *D. M. R. Leask.* 1947. pp. 11. [Mimeographed.] **162**

Crop costs for 1946 of oats and potatoes are reviewed. Records for 29 oat crops on 28 farms were completed. The farms varied from hill-sheep farms to intensive arable farms, and approximately 21 per cent of the total arable acreage was under oats. Wide variations occurred in soil type, the position of oats in the rotation, and rental values per acre. Figures are given for crop costs per acre, yields per acre, and cost per cwt. of grain. Average cost of growing one acre of oats was £14 9s. 1d., or 4 per cent higher than in 1945, but yields per acre were 25·5 cwts. as opposed to 23·75 cwts. in 1945, thereby reducing the average cost per cwt. Evidence suggests that, at least on better-class land, the crop is reasonably remunerative when a good crop is secured.

The 1946 investigation of the potato crops again illustrates great variations in costs. The 24 records completed covered 342·5 acres, and show that the crops were grown under a wide range of differing conditions. Tables are included showing range of elevation, summary of preceding crops, rental values per acre, and field sizes, with a detailed tabular account of costs of production per acre. For 20 crops pitted in 1946, the average cost per acre was £53 14s. 6d.; in 1945, the average cost was £47 7s. 0d. per acre for the 30 crops investigated. Ths upward tendency in the cost of man labour and the increase in tractor work combined with all-round increases in overhead costs is reflected in the higher crop costs.—P. M.

Manchester University, Faculty of Economic and Social Studies (Agricultural Economics Department). **Oat crop costs, 1945. (Shropshire and Staffordshire area.)** 1946. pp. 2. [Mimeographed.] **163**

Statistical data applying to 69 acres and 10 farms. Net cost per acre was £16 0s. 1d.—P. M.

Manchester University (Agricultural Economics Department). E.C.S. No. 11. **Oat crop costs, 1945.** 1946. pp. 2. [Mimeographed.] **164**

With a grain yield per acre of 23·8 cwt. and a straw yield of 24·1 cwt., total return is £17 4s. 6d., net costs £16 0s. 1d., net returns £1 4s. 5d.—R. O. W.

Roberts, B. H. **Costs of producing oats and hay on Welsh farms in 1945.** 1947. 14. [Mimeographed.] **165**

In the case of oats, 54 crop records were obtained with farms grouped into yield classes. The analysis shows a definite relationship between costs and yields. Whereas costs per acre for the lowest yielding group were £8 10s. 0d. per acre, and for the highest yielding group up to £12, the average costs per cwt. were about 15s. 0d. and 9s. 6d. respectively.

Thirty-one farms provided information on costs of seeds hay. Costs per acre varied between £5 and £16, the average being £8 10s. 1d. Average yield was high, being 2 tons per acre, but it must be noted that the sample of farms represented a mixed farming group where milk production was prominent.

Costs of producing meadow hay were obtained from 25 farms. The average total cost was £5 7s. 4d., whilst the average yield of 37 cwt. per acre was well above the average yield for Wales.—P. M.

Giberti, H., García, Nora W. R. de S., & Domínguez, M. R. La avena en la Argentina. Area sembrada y cosechada, rendimiento y producción. [**Oats in Argentina. Area sown and harvested, yield, and production.**] *Granos.* **10.** No. 1–3. 3–45. [English summary, 26.] 1946. [Dir. Cereales, Lino y Forrajes, Min. Agric., Argentine Republic] **166**

An economic study. The subject is reviewed from 1934 to date.—G. M. R.

Texas Agricultural Experiment Station. Bull. 676. **Information basic to adjustments in rice production in Texas.** By *A. C. Magee* abd *C. A. Bonnan.* 1945. pp. 46. **167**

The purpose of this bulletin is to assist Texas farmers to adjust their post-war production methods of rice-growing to meet the competition restored by the Asiatic countries. A detailed survey of sixty-six rice growers was used to estimate the effect on income of such factors as size of farm, variations in price and yields, systems of farming and harvesting methods. The following conclusions were reached bearing on adjustments to be made for obtaining maximum returns :—

(1) An annual *Oryza sativa* crop of 400 acres is more profitable than either an average-sized crop of 282 acres or a small 180-acre crop.
(2) Larger earnings were obtained by tenant farmers under cash rent than under share-crop rent.

(3) Yields must be kept above 10 barrels per acre to ensure profitable production. Rotation with three- or four-year pastures is essential for maintaining high yields.
(4) The "rice-cattle" system of farming is more profitable than the "rice" system but requires considerably more capital.
(5) It is more profitable to lease for cash than to own land.
(6) Farm earnings are increased by combine harvesting and artificial drying.—M. E. E.

LEEDS UNIVERSITY ECONOMIC SECTION (DEPARTMENT OF AGRICULTURE). Farmers' Report No. 63. **Some costs of growing wheat in Yorkshire : 1945.** 1946. pp. 14. [Mimeographed.] **168**

Sizes of farms studied were in the following groups : 100–200 acres (six farms), 200–300 acres (seven farms), 300–400 acres (five farms), 400–500 acres (two farms), and above 500 acres (one farm). Twenty farms harvested with binder (net cost £12 6s. 10d. per acre), two with combine (£10 14s. 3d. per acre). Total costs per acre were £12 1s. 2d., total receipts, including acreage payment, £19 2s. 1d. An incidental point is that farmers have shown that the presence of rye grasses in seeds mixtures adversely affects the succeeding wheat crop, because of frit-fly or *Ophiobolus*.—R. O. W.

READING UNIVERSITY DEPARTMENT OF AGRICULTURAL ECONOMICS. Misc. Cost Stud. No. 7. **Costs and returns from wheat production in the southern province in 1945.** By *G. B. Bissett* and *L. G. Bennett*. 1946. pp. 3. [Mimeographed.] **169**

Average yield from 22 specimen fields was 4·3 quarters per acre (range from under 3 to over 6), returns ranged from £12 2s. 8d. to £28 4s. 1d. per acre with average of £18 9s. 1d. (including statutory acreage payment of £4 per acre and value of straw). Over-all average surplus was £8 3s. 9d. per acre.—R. O. W.

WYE COLLEGE (UNIVERSITY OF LONDON) DEPARTMENT OF ECONOMICS. Rep. No. 39. **Investigation into farming costs of production and financial results. Corn growing : costs of production and financial results, 1940 to 1945.** By *J. Wyllie*. 1947. pp. 115. **170**

The financial results from wheat, barley, oats, beans, and peas (grey and maple) on a number of farms in the south-eastern counties for the six years 1940–45 are presented and analysed. Average profit from wheat, before reckoning interest on capital or managerial salary, was £6 6s. 4d. per acre, from barley £13 15s. 9d., and from oats £2 13s. 9d., while beans showed an average loss of 17s. 11d. and peas £3 8s. 9d. per acre. These figures are not necessarily representative of corn-growing results in other parts of the country. Financial success of the farmers who co-operated was not due so much to low costs, but rather to higher yields per acre. Average yield of wheat was 21·8 cwt., of barley 21 cwt., of oats 21·1 cwt.—P. M.

HUNTER, H. **The drying of grain for seed purposes.** *J. R. Agric. Soc.* **107.** 134–141. 1946. (176, Huntingdon Road, Cambridge] **171**

There are well-founded reasons for a wider adoption of drying in the British Isles in relation to cereals, based on what may be termed the economics of cereal production rather than on a fundamental change in the character of the climate. Undoubtedly the most significant reason for its wider adoption in recent years is the advent of the Combine Harvester, which, in the period of its early appearance, was accepted as a means of lowering the cost of harvesting and threshing, the two large items of costs in cereal production. The Combine Harvester achieved this result, and it is generally conceded, moreover, that in view of the limited man power available to agriculture during the war it would have been impossible to secure the relatively vast harvests of that period without it.—Extract.

JENKINS, B. C., PLATT, A. W., & THOMSON, L. B. **The field increase of cereals during the winter months.** *Sci. Agric.* **27.** 157–161. 1947. **172**

Hybrid populations and increase plots of wheat, oats, barley, and flax were grown as winter crops in the Imperial Valley of California during the winters of 1944–45 and 1945–46. Wheat, barley, and flax plots all matured by 1st May, and gave high yields. Oats were a few days later in maturing, and gave high yields in 1944–45 but low yields in 1945–46. By means of winter increase, the cereal breeding programme can be materially shortened with resultant economic advantage to the country as a whole.—Author's summary.

КРЕТОВИЧ, В. Л., РАЛЛЬ, Ю. С. и ТРИСВЯТСКИЙ, Л. А. Вещества, обусловливающие горькополынный вкус и запах зерна. *Биохимия* Том 11. Выпуск 6, стр. 493-9. 1946.
KRETOVIČ, V. L., RALLJ, JU. S., & TRISVJATSKIĬ, L. A. [**Substances producing the odour and bitter taste in grain.**] *Biohimija* **11.** 493–499. 1946. [Inst. Food Technology, Moscow] **173**

Artemisia absinthium and *A. sieversiana* occur in grain fields in some regions of the

Soviet Union and the cereal grain becomes contaminated due to adhesion of absinth dust or to penetration of the glucoside absinthin dissolved in the grain. Mechanical removal of the dust is a remedial measure.—M. H.

GRØNTVED, P. Ukrudtsbekaempese i kornmarkerne. **[Weed control in cereal fields.]** *Ugeskr. Landm.* **92.** 329–330. 1947. **174**

In recent years, *Brassica campestris, Sinapis arvensis*, and *Raphanus raphanistrum* have been successfully controlled by means of a 3 to 3·5 per cent solution of blue vitriol. Calcium cyanamide dusted on the plants at the rate of 200 kg. per ha. was widely used in the war years, and had a good effect when weather conditions were favourable. Hormone preparations were tested in many trials in Denmark in 1946 and are now (1947) on the market. They are efficacious against a larger number of weed species than the older herbicides, but, as they have a harmful effect on dicotyledonous cultivated plants, they cannot be used in cereal fields in which leys have been sown. In grass seed fields, they destroy a number of biennial weed species or prevent them setting seed, and in seed fields of perennial grasses it may be necessary to kill or check unwanted clover plants of previous years. In such cases a slightly stronger solution should be used than in cereal fields.—R. P. J.

VIDME, T. Natriumklorat som middel mot frøugras i kornåker. **[Sodium chlorate in the control of weed seeds in cereal crops.]** *Norsk. Landbr.* **9.** 141–143. 1943. **175**

Results of Danish trials are reviewed and compared with those obtained in Norway. Further experimentation is necessary before sodium chlorate can be recommended as a general substitute for sulphuric acid in the control of weed seeds.—R. P. J.

TAYLOR, D. L. **Growth of field crops in soil treated with chemical growth-regulators.** *Bot. Gaz.* **108.** 432–445. 1947. [Hull Botanical Lab., Univ. Chicago] **176**

2, 4-Dichlorophenoxyacetic acid (2,4-D) and isopropyl-N-phenyl carbamate (IPPC) were applied as top dressings in dry form at 1 to 4 lb. per acre. Weeds were controlled by 2,4-D. IPPC was not effective on dicotyledonous weeds, and had only a slight temporary inhibitory effect on grass weeds. Crop improvement, when grown in soil treated with 2,4-D, was demonstrated by maize and kidney bean.—D. B.

GUNDERSON, H. **Feed corn borers poison.** *Iowa Fm Sci.* **1.** 6–8. 1947. **177**

Costs ranging from two to five dollars per acre for each application of insecticide are easily justified by the increased yields of *Zea mays* obtained. Rotenone and D.D.T. sprays are effective controls for the European corn borer and can be applied by sprayers, dusters, or aeroplanes. One aeroplane can dust up to 500 acres per day, and the expense is no greater than that incurred by other methods of application. —M. E. E.

ANDERSON, J. C., & WOLF, D. E. **Pre-emergence control of weeds in corn with 2,4-D.** *J. Amer. Soc. Agron.* **39.** 341–342. 1947. [New Jersey Agric. Exp. Sta., New Brunswick] **178**

Annual grasses and broad-leaved weeds are effectively controlled for about six weeks, by which time *Zea mays* does not suffer severe competition from new weeds. 2·7 lb. of 2,4-D effectively controlled weeds, and had no detrimental effect on production of maize.—D. B.

LOUISIANA AGRICULTURAL EXPERIMENT STATION. Bull. 411. **The use of 2,4-D in rice fields for the control of weeds.** By *T. C. Ryker* and *Clair A. Brown.* 1947. pp. 14. **179**

Broad-leaved weeds have been effectively controlled in fields of *Oryza sativa* by 2,4-D applied in dusts and sprays. The effect of time of treatment on weed control, different methods of application and the comparative effectiveness of dusts and sprays were studied. Special recommendations are made for treating *Caperonia castaneaefolia, Sesbania macrocarpa,* and *Aeschynomene virginica.*—M. E. E.

RYKER, T. C. **Studies on the chemical control of rice weeds.** *J. Amer. Soc. Agron.* **39.** 395–402. 1947. [Louisiana Agric. Exp. Sta., Baton Rouge] **180**

Losses in Louisiana due to weeds in rice fields are well over a million dollars annually. Apart from grasses, the most important weeds in rice are indigo (*Sesbania macrocarpa*), curly or frizzle indigo (*Aeschynomene virginica*), and Mexican weed or birdeye (*Caperonia castaneaefolia*). Indigo and curly indigo can be controlled by hand pulling at a cost of one to ten dollars per acre, using cheap labour. Grasses and other weeds are controlled by early flooding of rice 10–20 days after emergence of seedlings.

Of the chemical herbicides used on the three weeds named above, 2,4-D was more effective than Sinox. In the case of Mexican weed, treatments were only effective if given earlier than three weeks after flooding. Curly indigo was more resistant than indigo, and repetition of the treatment was necessary. Dusting of these weeds was as effective as spraying. Large increases in rice yields were obtained when weeds were controlled.—D. B.

ORCHARD, H. E. **Skeleton weed** (*Chondrilla juncea*, **L.**). *J. Dept. Agric. S. Aust.* **50.** 435–441. 1947. **181**

Since its comparatively recent introduction into the country, skeleton weed has spread to extensive areas, and now occupies much land in the Riverina and other parts of New South Wales, northern Victoria, and now the Murray Mallee in South Australia. In the latter State, *Chondrilla juncea* is proving a grave menace to wheat farmers, since its perennial and extremely vigorous root system makes it very difficult to control. On grossly infected country, wheat production becomes impossible, and even where it is less serious it results in lowered yields, weakened straw and lodged crops. Skeleton weed also has a crippling effect on fodder plants in sown pastures because it removes large amounts of moisture and nitrates from the soil. The present methods of control in South Australia are usually concerned with small patches where the weed can be cleaned up entirely by applying salt to individual plants or by spraying patches with sodium chlorate directly on the rosettes. Early stubble burning prevents seed formation, and careful handling of sheep during the seeding period is essential to prevent further distribution of the weed. Where soil conditions permit, *Medicago sativa* provides a suitable competitive plant in the early stages of control.—M. E. E.

KLINGMAN, D. L. **Effects of spraying cereals with 2, 4-dichloro-phenoxyacetic acid.** *J. Amer. Soc. Agron.* **39.** 445–447. 1947. [Wyoming Agric. Exp. Sta., Laramie] **182**

Results of spraying the crop at various stages of growth are given.—D. B.

NEWTON, MARGARET, & CHEREWICK, W. J. **Erysiphe graminis in Canada.** *Canad. J. Res.* **25.** Sect. C. 73–93. 1947. [Science Service, Ottawa, Canada] **183**

POEHLMAN, J. M. **Sources of resistance to loose smut,** *Ustilago nuda*, **in winter barleys.** *J. Amer. Soc. Agron.* **39.** 430–437. 1947. [Univ. Missouri, Columbia] **184**

This disease causes widespread damage in Missouri, and an investigation was undertaken to find those varieties which would be sources of resistance to the disease in a breeding programme. The hooded types were, on the whole, resistant (17 out of 23) ; all of the resistant hooded selections were from one of the Tennessee Beardless varieties or from Missouri Early Beardless. Of the awned varieties, only two of the 42 were resistant.—D. B.

LIVINGSTON, J. E. **Barley fertilizer and seed treatment test.** *Phytopathology* **37.** 426–428. 1947. [Nebraska Agric. Exp. Sta., Lincoln] **185**

Root rot is one of the major causes of reduced yields of *Hordeum vulgare* in Nebraska. The damage fluctuates from year to year. Combined fertilizer (containing nitrogen and phosphorus) and seed treatment (New Improved Ceresan) gave much more vigorous growth and higher yields than when either treatment was used alone.—D. B.

PEPPER, B. P., & CARRUTH, L. A. **A new plant insecticide for control of the European corn borer.** *J. econ. Entomol.* **38.** 59–66. 1945. [New Jersey Agric. Exp. Sta., New Brunswick (B.P.P.) and New York State Agric. Exp. Sta., Geneva (L.A.C.)] **186**

Ryanex, an insecticide prepared from the tropical plant *Ryania speciosa*, used as a dust (30 to 50 per cent) in the control of *Pyrausta nubilalis* has proved as effective as D.D.T. and more effective than dusts containing nicotine and rotenone.—D. B.

QUESTEL, D. D. **Comparative effects of spray and dust treatments on European corn borer.** *J. econ. Ent.* **38.** 52–56. 1945. [Bur. Entomol. and Plant Quarantine, Agr. Res. Adm., U.S.D.A.] **187**

Field tests showed that spray was more effective than dusts in killing *Pyrausta nubilalis* on *Zea mays* and that spray residues remained effective longer than dust residues. Rainfall increased the mortality caused by the sprays, but reduced the efficiency of the dusts.—D. B.

GUNDERSON, H. **Fight corn borers in '47.** *Iowa Fm Sc.* **1.** 13–14. 1947. **188**

A determined effort is needed to reduce the ravages of the European corn borer (*Pyrausta nubilalis*) in Iowa, chiefly clean ploughing, changing oat planting practices, changing rotations, and putting more maize into silage and shredded fodder.—R. O. W.

WALLACE, C. R. **Combating the black beetle in maize. Soil jetting experiments with D.D.T. and "666."** *Agric. Gaz. N.S.W.* **57.** 543–545 and 550. 1946. **189**

Experiments with insecticidal emulsions injected into the soil around *Zea mays* plants resulted in complete control of *Heteronychus sanctae-helenae* for periods up to three months. Benzene hexachloride "666" secured the greatest number of beetle kills, and no appreciable differences in yield were recorded. It is estimated that 150–200 gallons of emulsion are required to treat an acre of maize.—M. E. E.

SPARROW, F. K. **Observations on chytridiaceous parasites of phanerogams. II. A preliminary study of the occurrence of ephemeral sporangia in the Physoderma disease of maize.** *Amer. J. Bot.* **34.** 94–97. 1947. [Univ. Michigan, Ann, Arbor.] **190**

THOMAS, I., BROWN, E. B., & WILLIS, R. J. **The cereals root eelworm,** *Heterodera major* (*O. Schmidt*) **Franklin, in North Wales.** *Ann. appl. Biol.* **33.** 63–65. 1946. [School of Agric., Univ. Coll., N. Wales, Bangor] **191**

This eelworm is shown to be locally distributed in North Wales, the most heavily infested centres being in the arable districts of the eastern counties of the province. The most severe attacks occurred on oats where the crop had been grown too frequently; wheat and barley were apparently unaffected at the cyst populations encountered. Two tables are given to show the cropping of eelworm-infested fields in four specific areas. The crops concerned were barley, grass, oats, roots, rape, swedes, and wheat.—G. M. H.

ГАЛАХОВ, П. Н. О мероприятиях по борьбе с "закукливанием" овса в подтаежной зоне Восточной Сибири. *Доклады Всесоюз. Акад. С.-Х. Наук* 1946. № 9-10, стр. 16-8.

GALAHOV, P. N. [**Measures for control of "zakuklivanie" virus disease on oats in the subtaiga zone of East Siberia.**] *Doklady Vsesojuz. Akad. S.-H. Nauk* 1946. No. 9–10. pp. 16–18. [Tulunsk State Selection Sta.] **192**

See also *Herb. Abstr.* 11, Abs. 1448 and 1449. In the continental Kirov region, in west and east Siberia, in Burjat Mongolia ASSR and some regions of the Far East, there is wide distribution of this virus disease of oats, in which *Delphax striatella* is the vector. Cultural measures to prevent hibernation of the larvae of the insect are recommended. These include substituting a luxuriant growth of *Agropyron* for the usual cereal sowings, or choosing a sowing date for oats towards the end of May, depending on weather conditions.—M. H.

MISSOURI AGRICULTURAL EXPERIMENT STATION. Circ. 312. **New oat disease increases importance of seed treatment.** By *C. H. Kingsolver.* 1947. pp. 4. **193**

A new blight and root-rot of oats associated with stem breakage is being caused by the fungus *Helminthosporium victoriae.* The Clinton variety of *Avena sativa* is resistant to the new disease as well as to rusts and smuts, but sufficient seed will not be available for all Missouri requirements in 1947. Columbia oats are blight resistant, but are susceptible to rusts and smuts. Other susceptible varieties can be treated with New Improved Ceresan which will prevent crop losses.—M. E. E.

SHERF, A. F., PAGE, R. M., TULLIS, E. C., & MORGAN, T. L. **Studies on factors affecting the infectivity of** *Helminthosporium oryzae. Phytopathology.* **37.** 281–290. 1947. [Camp Detrick, Frederick, Md.] **194**

BRANDE, J. VAN DEN, & ONSEM, J. VAN. Het stengelaaltje Ditylenchus, Dipsaci, van de rogge. [**The stem borer of rye, Ditylenchus dipsaci.**] *Med. LandbHoogesch. Gent.* **12.** 213–233. [French, English, and German summaries, 227–229.] 1947. **195**

Observations, based on experiments, were made on the manner of attack; symptoms of the disease produced; secondary parasites; the activity of *D. dipsaci* in the soil, both vertically and horizontally; the relative insignificance of weeds as reservoir hosts; indirect means of dispersal; environment and cultural technique in their effect on the disease; control by means of (*a*) fertilizers, (*b*) insecticides; and resistant varieties of rye. Of nine varieties tested, only Ottersum, a Belgian local rye, proved resistant. —G. M. R.

CHOWDHURY, S. **A Gibberella blight of rye hitherto unrecorded from India.** *Curr. Sci* **16.** 152–153. 1947. [Plant Path. Lab., Sylhet, Assam] **196**

This severe blight of *Secale cereale* was first observed in India during August, 1946, in Assam. The ears and grains also were infected with *Gibberella saubinetii* which caused browning of the glumes, shrivelled kernels, and abundant pink coating of fungus growth similar to the effects of this scab disease in cereals in other continents.—M. E. E.

GLYNNE, MARY D. **Eyespot of wheat and barley in Scotland in 1944.** *Ann. appl. Biol.* **33.** 35–39. 1946. [Rothamsted Exp. Sta., Harpenden] **197**

In August, 1944, eyespot (*Cercosporella herpotrichoides* Fron.) was found in 90 out of 121 autumn-sown wheat crops distributed over 12 Scottish counties. It was abundant enough in 40 fields to be likely to harm subsequent crops. It was also found in 17 out of 18 spring-sown barley crops, more than half the straws being infected in seven of them.

Eyespot increased with the frequency of wheat and barley in the two preceding years, but a few infested crops occurred on fields where no wheat or barley had been grown for many years. In Scotland, where the atmosphere is more humid, eyespot tends to increase more rapidly than in similar rotations in England, lesions are found higher up the straw, and the disease is much more prevalent on spring-sown barley. The long rotations practised in Scotland prevent more extensive damage by eyespot.—G. M. H.

Lansade, M. Essais de lutte contre la carie du blé (*Tilletia tritici* (Bjerk.) Wint.) en 1943 et 1944. [**Control of bunt (*Tilletia tritici* (Bjerk.) Wint.) on wheat during 1943 and 1944.**] *Ann. Épiphyt.* **11.** 177–189. 1945. [Stat. Centr. Pathologie végétale] **198**

Australia, Council for Scientific and Industrial Research. Bull. 199. **The use of mineral dusts for the control of wheat pests.** By *F. Wilson.* 1946. pp. 31. **199**

The predominant pest in wheat storage at bulk depots is *Rhizopertha dominica.* Magnesite and dolomite dusts have reduced the number of live insects and a dust-cum-fumigation method has proved very satisfactory for their control. The grain of *Triticum vulgare* is materially unaffected by these mineral treatments, which cost about 0·03 pence per bushel. —M. E. E.

ГОРЛЕНКО, М. В. Влияние внешних факторов на развитие мучнистой росы пшеницы. *Доклады Всесоюз. Акад. С.-Х. Наук* 1946. № 9-10, стр. 13-5.

Gorlenko, M. V. [**The influence of environmental factors on the development of powdery mildew of wheat.**] *Doklady Vsesojuz. Akad. S.-H. Nauk* 1946. No. 9–10. pp. 13–15. [Moscow Branch, All-Union Plant Prot. Inst.] **200**

Experiments carried out in 1939 showed that wheat is attacked equally well in all cases when the air humidity ranged from 50 to 100 per cent; and that high humidity rather accelerated than prevented the occurrence of the disease, while high temperature of the air retarded the development of the fungus. Subsequent investigations indicated that plants with a decreased turgor resulting from prolonged drought were more susceptible to attack than those provided with sufficient moisture. This explains the fact that wheat crops grown in drought-susceptible regions show a reduced resistance to the disease.—H. F.

ЧЕСНОКОВ, П. Г. Устойчивость к шведской мухе главнейших стандартных сортов яровых пшениц СССР. *Доклады Всесоюз. Акад. С.-Х. Наук* 1946. № 9-10, стр. 10-2.

Česnokov, P. G. [**Resistance to Oscinella frit L. in the principal standard varieties of spring wheat, U.S.S.R.**] *Doklady Vsesojuz. Akad. S.-H. Nauk* 1946. No. 9–10. pp. 10–12. 1946. [All-Union Sci. Res. Inst. Plant Production] **201**

Work on this subject has been carried out during the last ten years, primarily at Puškin, in the Leningrad region, on more than 600 forms of spring wheat, and also in areas where wheat sowings were badly damaged by this pest, notably in 1938 and 1940 at the Kuban Station, in 1937 at Maĭkop (Krasnodar territory), and in 1938 at Vorošilovsk (Stavropol territory). Wheat varieties from different sources are classified into two groups according to resistance and extent of damage. The following were badly infested: Novinka (Puškin Sta.); Erythrospermum 0841 (Krasnokut Sta.); Kubanka (Kazah S.S.R.); Punjab type 18 (India); and V. barbasossa (China). There are, among normally resistant varieties, forms very susceptible in some regions to *O. frit,* and it is recommended that attention should be given to local material for selections adaptable to different zones.—M. H.

Popp, W. **A rapid method of examining wheat heads for bunt infection.** *Phytopathology* **37.** 418–420. 1947. [Dominion Lab. Plant Pathology, Winnipeg, Manitoba, Canada] **202**

Bamberg, R. H., Holton, C. S., Rodenhiser, H. A., & Woodward, R. W. **Wheat dwarf bunt depressed by common bunt.** *Phytopathology* **37.** 556–560. 1947. [Agric. Exp. Stations of Montana, Washington, and Utah] **203**

Atkins, I. M., Hansing, E. D., & Bever, W. M. **Reaction of varieties and strains of winter wheat to loose smut.** *J. Amer. Soc. Agron.* **39.** 363–377. 1947. [Div. Cer. Crops and Diseases, Bur. Plant Ind., U.S.D.A. (I.M.A. and W.M.B.) and Kansas Agric. Exp. Sta. (E.D.H.)] **204**

Vallega, J. Reacción de algunas especies espontaneas de "Hordeum" con respecto a las royas que afectan al trigo. [**Reaction of some wild species of Hordeum to the rusts which affect wheat.**] *Rev. Invest. agríc.* **1.** 52–62. 1947. [Chief, Div. of Plant Immunology, Min. Agric., Argentine Republic] **205**

The behaviour of *Hordeum murinum, H. leporinum, H. pusillum* var. *typicum, H. pusillum* var. *euclaston, H. compressum, H. jubatum* var. *pampeanum,* and *H. spontaneum* after inoculation with *Puccinia glumarum*, *P. rubigo-vera tritici*, and *P. graminis tritici* was studied. The different reactions of the grasses, all common in the cereal region of Argentina, are described. These grasses can play an important part in the diffusion of the races of *Puccinia glumarum* and *P. graminis* which affect wheat; but, as the life cycle of the most susceptible *Hordeum* species coincides approximately with that of wheat, the grasses can hardly constitute intermediate hosts for the parasites from one season to another.—G. M. R.

SASS, J. E. **The development of endosperm and antipodal tissue in Argentine waxy maize.** *Amer. J. Bot.* **33.** 791–795. 1946. [Iowa State College, Ames] **206**

Starch of "Argentine waxy" maize contains 2 to 3 per cent amylose, the straight chain starch which stains blue with iodine. In ordinary waxy maize, the endosperm starch stains yellow with iodine. An anatomical study of the caryopsis to determine the location of amylose is described. The enlarging endosperm invades the nucellus, and the distal surface produces one or more lobes, which become filled with starch. Some of these become cut off as "island tissues". In this strain of *Zea mays*, the antipodal tissue becomes obliterated and does not contribute starch-bearing cells to the food reserve. Starch of the triploid endosperm stains pale violet and that of the diploid embryo of the same kernel stains blue-black.—D. B.

WANG, F. H. **Embryological development of inbred and hybrid** *Zea mays* **L.** *Amer. J. Bot.* **34.** 113–25. 1947. [Univ. Illinois, Urbana] **207**

This is a study of growth rate between fertilization and maturation of the seed of *Zea mays*. Hybrid embryos and endosperms were larger than those of the maternal parents, the difference being more marked in the early stages. In the hybrid the growth rate of the embryo is greater than that of the endosperm during the early stages of development, but this difference is not maintained. The bearing of these observations on hybrid vigour is discussed.—D. B.

ESAU, KATHERINE. **Ontogeny of the vascular bundle in** *Zea mays*. *Hilgardia.* **15.** 327–356. 1943. [Received 1947.] [Univ. of Calif., Berkeley] **208**

The vascular system of *Zea mays* as a representative monocotyledon is described. Experimental material was taken from plants of the Golden Cross Bantam variety, and the vascular bundles of the leaf sheath, internode, and node were examined. The ontogenetic details are discussed with reference to the largest leaf-sheath and stem bundles through the stages of the procambium, protophloem, and metaphloem differentiation.—M. E. E.

FREITAS, A. P. DO C. E Cariopse do milho (*Zea mays* L.). Variação de pêso e volume consoante a posição na espiga. [**Caryopsis of** *Zea mays*. **Variation in weight and volume according to position on the cob.**] *Bol. Soc. brot.* **19.** 655–668. 1945. [Received 1947] [Est. Agron. Nac., Sacavém, Portugal] **209**

The caryopses of maize are arranged in more or less regular rings around the axis of the cobs. Tabulated data are presented on volume, weight, and density of the caryopses in 14 cobs, having in some cases as many as 47 such rings. Three divisions of the cob are recognized, the base, the middle and the end. Volume and weight are nearly always greater at the base of the cob, excepting in the first or first and second rings. In regard to density, no appreciable difference was found between this and the other zones of the cob. In weight and volume the caryopses of the end of the cob are generally inferior to those of the middle zone.

These findings have a bearing on the common agricultural custom of selecting seed for sowing solely from the middle of the cob, while discarding seed from the base and the top. Germination capacity, etc., being equal, no justification is seen for discarding the heavier and larger seeds from the base of the cob when the density remains fixed. The case of seeds from the top is different; their lower weight and volume render their value more doubtful, and, because they are the last to be formed, it is possible that an optimal stage of maturity has not yet been reached.—G. M. R.

СКОРОХОДОВ, П. И. К биологии цветения проса. *Селек. Семеновод.* 1947. № 1, стр. 62-3.

SKOROHODOV, P. I. [**The biology of flowering in millet.**] *Selek. Semenovod.* 1947. No. 1. 62–63. **210**

In 1939 and 1940, observations were made by the Kabardinsk Selection Station (situated in the northern foothills of the Caucasian range) on flowering behaviour of a local millet growing at three different altitudes, namely at Naljčik (508 m.), at Malo-Kabardinsk Irrigation Station (240 m.), and in the Baksansk Gorge (1724 m.). The normal process of flowering in the region is outlined, and factors which influence blooming are discussed.—M. H.

Chatterjee, D. **Botany of the wild and cultivated rices.** *Nature, Lond.* **160.** 234–237. 1947. [Herbarium, Roy. Bot. Gardens, Kew] **211**

There is no comprehensive account of the rice plant with a proper interpretation of all its structures, its evolution, and domestication by man. The present work is designed to record some of the data, and a fuller account, with a key to the species and their synonymy, is to be published elsewhere.—M. H.

БРЖЕЗИЦКИЙ, М. В. Сравнительно-морфологические особенности вегетативных органов у риса (*Oryza sativa* L). *Извест. Азербайджан. Фил. Акад. Наук СССР.* 1942. Вып. 1, стр. 64.
Bržezickiĭ, M. V. [**Comparative morphological features of the vegetative organs of rice** (*Oryza sativa* **L.**).] [Abstract only.] *Izvest. Azerbaĭdzan. Fil. Akad. Nauk S.S.S.R.* 1942. pp. 64. **212**

Three years' morphological study of some 350 samples from various regions concerned also the changes in organs as affected by the type of cultivation.—M. A. O.

Pepper, J. H., Hastings, E., & Douglas, T. A. **The mode of absorption of carbon tetrachloride by wheat.** *J. econ. Ent.* **40.** 64–73. 1947. [Montana Agric. Expt. Sta., Bozeman.] **213**

The average composition of wheat grown in the Rocky Mountain States was taken as an index for the material being fumigated. Quantities and rates of uptake of CCl_4 by whole and ground samples of *Triticum vulgare* were measured by a manometric method, and the additional absorption shown by ground wheat was attributed to amounts of CCl_4 not held in ideal solution. Unground wheat required three days and ground wheat only one day to attain virtual absorption equilibrium, but the temperature coefficients of absorption of both grains approximated to the heat of condensation of carbon tetrachloride vapour to pure liquid.—M. E. E.

Gregory, F. G., & Purvis, O. N. **Abnormal flower development in barley involving sex reversal.** *Nature, Lond.* **160.** 221–222. 1947. [Res. Inst. Pl. Physiol., Imp. Coll. Sci. Tech., S. Kensington, London, S.W.7.] **214**

The abnormal condition in much of the barley crop of East Anglia (*Herb. Abstr.* 17, Abs. 1851) is due to the formation of carpelloid stamens. The phenomenon is not uncommon, and the ovaries in such abnormal flowers can be fertilized and produce normal grain. The fears expressed regarding effect of the abnormality on harvest prospects are largely groundless.—M. H.

КУДРЯВЦЕВ, В. А. Влияние яровизации на отношение ячменя к аммонийному и нитратному азоту. *Доклады Акад. Наук СССР*, Том 53. № 2, стр. 161-4, 1946.
Kudrjavcev, V. A. **Influence of vernalization upon the response of barley to ammonium and nitrate nitrogen.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **53.** 157–160. 1946. [Leningrad Inst. Agric.] **215**

The effect of vernalization of seeds before sowing on response of the plants to cultural processes is considered in the light of Krenke's theory (*Herb. Abstr.* 15, Abs. 401), with special reference to comparison of age variation in vernalized and non-vernalized plants with absorption of nitrogen.—M. H.

Britten, E. J. **The effect of naphthaleneacetic acid on the developing maize caryopsis.** *Amer. J. Bot.* **34.** 211–218. 1947. [Exp. Farm, Brandon, Manitoba, Canada] **216**

Ears of *Zea mays* were treated with α naphthaleneacetic acid. Kernels on one lengthwise half of the ear were sprayed with the acid while those on the other half were left as controls. Some ears were sprayed before, others after, pollination.

Treatment 24 hours or more before pollination resulted in parthenocarpic development, and prevented fertilization. Treatment at time of fertilization (22 hours after pollination) resulted at first in stimulation and later in retardation of growth of caryopses. The most conspicuous effect of the treatment was curvature towards the treated side of the ear resulting from retarded growth. Treated caryopses were narrower, thinner, more variable in length, less wrinkled, and lighter in weight than were controls. In dent hybrids the normal red colour did not develop on the treated side. The treatment was strictly local in its effect.

Histological abnormalities in nucellus, pericarp, endosperm, and embryo are described. Interference with carbohydrate metabolism is suggested as a reason for abnormal growth.—D. B.

Jones, D. F. **Effect of temperature on the growth and sterility of maize.** *Science* **105.** 390–391. 1947. [Connecticut Agric. Exp. Sta., New Haven] **217**

Varieties of *Zea mays* grown at the same latitude in the North-East and in the Middle-West are noticeably taller in the East. Light intensity and temperature are the chief factors involved. Field trials show that plants are shorter under a great light intensity. Temperature has an effect in the early stages of growth. Specimens heat-treated in a greenhouse and later planted out were, at maturity, shorter, less vigorous, and later in flowering than were untreated plants.

The pollen of heat-treated plants was sterile. Though florets were well developed, anthers were shrivelled. "This influence on growth is an anti-vernalization effect, and may have wide usefulness in the production of hybrid seed, especially if it is shown by plants other than maize."—D. B.

Showacre, Jane L., & du Buy, H. G. **The relation of water availability and auxin in the growth of Avena coleoptiles and its meaning for a theory of tropisms.** *Amer. J. Bot.* **34.** 175–182. 1947. [Univ. Maryland, College Park] **218**

The well-known effect of auxin in bringing about elongation is due to auxin-enhanced water uptake, concomitant with the previously established auxin-induced increase in extensibility of the cell wall. In those series in which water but not an adequate oxygen supply was present, irregular growth resulted as evidenced by the twisting of the coleoptile cylinders. When both oxygen and water were available, the elongation of the coleoptiles was regular; the cylinders remained straight, or nearly so. The degree of twisting of the coleoptile cylinders provides a simple means of determining whether the conditions are adequate for physiological studies involving growth, protoplasmic streaming, etc.—Authors' summary.

Sircar, S. M., & Ghosh, B. N. **Effects of high temperature and short days on vernalization response of summer varieties of rice.** *Nature, Lond.* **159.** 605–606. 1947. [Biol. Dept., Univ. Dacca (S.M.S.) and Bot. Dept., Univ. Calcutta (B.N.G.).] **219**

In the works of Sircar, and Sircar and Parija (*Herb. Abstr.* 14, Abs. 1128, and 15, Abs. 1104), acceleration of flowering in winter rice varieties by short days have been reported, and confirmed by Kar (*Herb. Abstr.* 16, Abs. 1750). On the other hand, a presowing high temperature treatment accelerates flowering in summer varieties, but when this is followed by exposure of the seedlings to short day a reverse effect in the delay in flowering is noticed.

Thus Kar's statement that in different rice varieties warm temperature associated with short daylength is inducive to earliness, and cold temperature or longer daylength produces retardation, needs modification. In Aus varieties, long day tends to accelerate flowering, but in Aman varieties short day has this effect. —M. H.

ЯРКИНА, А. М. Селекция яровой пшеницы на устойчивость к грибным болезням. *Соц. Зерн. Хоз.* 1946. № 2-3, стр. 35-43.
Jarkina, A. M. [**Selection of spring wheat for resistance to fungous diseases.**] *Soc. Zern. Hoz.* 1946. No. 2–3. pp. 35–43. **220**

In breeding varieties resistant to fungous diseases, it is necessary to base evaluation on resistance of the parents and further of the hybrid forms in the infected zone under field conditions and in the greenhouse. By means of frequent individual selection of non-infected plants it is possible to isolate biotypes resistant to brown rust. By hybridization and subsequent selection of forms not susceptible to loose smut following artificial infection, it is possible to obtain plants with high resistance to this disease. To obtain forms which are high-yielding and resistant to loose smut, it is possible to use as parents varieties which are on the one hand highly resistant and on the other susceptible, but with valuable agronomic qualities. With artificial infection with loose smut of the seeds of hybrids of the earliest generations (first, second), definite depression was observed in the development of the plants in the progenies of these hybrids. In seed artificially infected with loose smut, a high percentage reduction in germination was noted compared with uninfected seed. Forms resistant to covered smut are obtained by hybridization and frequently repeated selection following artificial infection.—R. P. J.

КРАСОВСКАЯ, И. В. К физиологической характеристике сортов яровой пшеницы на Юго-Востоке. *Соц. Зерн. Хоз.* 1946. № 2-3, стр. 45-54.
Krasovskaja, I. V. [**Physiological characteristics of spring wheat varieties in the south-east.**] *Soc. Zern. Hoz.* 1946. No. 2–3. pp. 45–54. **221**

The object of the work has been to determine types of spring wheat with high yields and good resistance to conditions in the south-east U.S.S.R., and also, by means of selections, to evaluate and classify the varieties. The physiological characteristics and behaviour under different conditions have been compared of varieties selected for their contrasting features. These varieties are soft Lutescens 62, hard Hordeiforme 432, and three new types, Aljbidum C-43, Lutescens 53/12, and Lutescens C-605.—M. H.

ФОКЕЕВ, П. М. Вторичное укоренение яровой пшеницы и некоторые приемы его регулирования. *Соц. Зерн. Хоз.* 1946. № 4, стр. 3-11.

Fokeev, P. M. [**Secondary rooting in spring wheat and some means for its regulation.**] *Soc. Zern. Hoz.* 1946. No. 4. pp. 3–11. **222**

The root system in spring wheat consists of roots belonging to the developing embryo, to the coleoptile, and to the nodes. Most investigators maintain that for high yields in winter wheat a good development of nodal roots is necessary ; on the other hand, some maintain that normal development of the plant results from the roots of the embryo. Research in the south-east of U.S.S.R. has shown that years in which yield of spring wheat is low are usually associated with the absence in the plant of secondary roots. Compared with other spring cereals, the formation of nodal roots is much retarded in spring wheat ; they appear at the beginning of tillering, when, in the south-east, the upper soil layers are dry. The investigations here reported are concerned with root formation in the variety Lutescens 062 and agrotechnical operations conducted at the Experimental Field of the Institute of Grain Husbandry, in Saratov, during 1944–46. The years 1944 and 1945 were suitable for the formation of nodal roots, and yield of grain was 31–34 centners per ha. In 1946, development of nodal roots was suppressed, and, in spite of the best treatments and cultivations, grain yield was only 7 centners per ha. It is concluded that, under conditions of the south-east, a sufficient amount of moisture is necessary in the soil layer of the tillering node. The work also contains information in seed type and sowing depth in relation to root formation.—M. H.

САБУРОВА, П. В. Физиологическое обоснование поражаемости пшеницы бурой ржавчиной (*Puccinia triticina*) под влиянием различной влажности почвы. *Бот. Ж. СССР*, Том 31. № 4, стр. 35-48. 1946.

Saburova, P. B. [**The physiological basis of the infection of wheat by *Puccinia triticina* under the influence of various degrees of soil moisture.**] *Bot. Ž. S.S.S.R.* **31.** pp.35–48. [English summary, pp. 47–48.] 1946. **223**

Different ecological types of varieties of *Triticum durum* and *T. vulgare* were grown in pots in which the moisture content of the soil varied between 25 and 75 per cent. The plants were infected at different stages of development, in different places, and different numbers of times. In order to study the connexion between the rate at which the mycelia could spread through the tissues of the host, and the type of infection which developed, on the one hand, and the biochemical conditions prevailing in the plant at the time of infection, on the other, the content of water, sugars, and nitrogenous compounds in the leaves and the osmotic pressure were estimated. The conclusion reached, expressed in its barest form, is that a moist soil results in a higher water content, a lower osmotic pressure, and a decrease in susceptibility to infection, which, furthermore, is closely connected with the content of protein and other nitrogenous compounds.—I. Z.

Chinoy, J. J. **Correlation between yield of wheat and temperature during ripening of grain.** *Nature, Lond.* **159.** 442–444. 1947. [Imperial Agric. Res. Inst., New Delhi] **224**

Work has been in progress during the last 5 years at the above Institute to evolve a reliable method of obtaining wheat varieties best suited to dry, as well as irrigated, tracts, and to determine their drought resistance. Details of the results are to be published elsewhere. It has been confirmed that in India early wheats are preferable to late ones, because of their capacity to avoid high temperatures. Selection should be on the correlation of yield and temperature during the ripening period.—M. H.

Bartel, A. T. **Some physiological characteristics of four varieties of spring wheat presumably differing in drought resistance.** *J. Agric. Res.* **74.** 97–112. 1947. [Divn. Cereal Crops and Diseases, U.S. Dept. Agric.] **225**

Growth characters of Baart, Ceres, Marquis, and Hope wheats were studied at Tucson, Arizona, on irrigated and non-irrigated plots in order to discover to what extent differences in drought resistance are correlated with moisture content of leaf blades and with osmotic pressure and total solids of extracted leaf-blade juices. Deficit of soil moisture reduced moisture content of leaves and increased osmotic pressure and percentage of total solids.—R. O. W.

Krosby, P., & Braadlie, O. Såvarekvaliteten i år. [**Quality of seed harvested in 1946.**] *Norsk Landbr.* **13.** 85–87. 1947. **226**

By the end of January, 1947, the number of samples received at the Seed Testing Station in Ås was 5300, approximately 1000 more than during the same period in the previous year. Tests showed the following results for cereals :—

	Power of germination. Per cent.			*Moisture content.*	
	No. of samples.	*Untreated.*	*Disinfected.*	*No. of samples.*	*Per cent.*
Oats ..	638	94·6	96·8	297	17·2
Barley ..	195	96·6	—	81	17·3
Spring wheat	544	94·9	96·7	334	18·3
Spring rye ..	13	89·5	93·8	8	16·5

Power of germination and weed content in seed of the most important meadow plants were :—

	Power of germination.		*Weed content.*	
	No. of samples.	*Per cent.*	*No. of samples.*	*Per cent.*
Timothy ..	140	94·1	206	0·70
Red clover ..	23	73·6	27	0·41
Alsike clover	6	74·0	—	—

The attention of growers is directed to the urgent need for controlling *Stellaria* in seed plots.

Analyses of samples received at the Seed Testing Station in Trondheim showed that the average power of germination of barley was approximately 96 per cent, of oats 93 per cent, and of wheat 92 per cent. Sprouting of grain occurred to some degree in oats and to a more marked extent in wheat. There was fusarium on oats and wheat. In oats it is common for power of germination to increase by 4–5 per cent following disinfection, but samples showing an increase of 20 per cent have been received. Five hundred of the barley samples examined showed threshing injuries.—R. P. J.

МУСИЙКО, А. С. Как проводить добавочное искусственное опыление с.-х. культур. Москва, 1941. Стр. 18.
Musiĭko, A. S. [**Supplementary artificial pollination of crops.**] Moscow, 1941. pp. 18. **227**

The advantages which result from artificial pollination include better seed quality and yields. Measures for applying the process in order to improve the crops of maize, sunflower, lucerne, hemp, rye, buckwheat, *Cucumis* sp., and millet are outlined.—M. H.

Brown, W. L., & Anderson, E. **The northern flint corns.** *Ann. Mo. Bot. Gdn.* **34.** 1–20. 1947. [Pioneer Hi-bred Corn Co., Johnston, Iowa (W.L.B.), Henry Shaw School Bot., Wash. Univ. (E.A.).] **228**

The slender-eared wide-kernelled flint maize types of New York State and New England were for centuries the most common type in eastern North America, but have become restricted to an ever-narrowing fringe along the northern edge of maize cultivation because of the northward advance of dent varieties and the development of earlier varieties of dents. They are now of secondary economic importance, but are of great interest to the maize breeder in view of their role in the production of the varieties which supplanted them, and to the archaeologist. These northern flint varieties are listed, and a representative collection has been grown for the study of gross morphology and pachytene cytology. The results of these investigations include the use of chromosome knob numbers for the study of varietal relationships and distinctions.—R. O. W.

Parodi, L. R. La especie progenitora de las cebadas domésticas. [**The ancestor of the cultivated barleys.**] *Ciencia Invest.* **3.** 267–269. 1947. [Prof. Bot., Univ. B. Aires and Univ. La Plata] **229**

A classification of *Hordeum* L. Sect. *Cerealia* Ands. is presented, based on the work of Åberg and Åberg and Wiebe (see *Plant Breeding Abstracts* 13, p. 274, and 15, Abs. 217 and 1408). The six-rowed, wild species *H. agriocrithon* E. Åberg, with brittle rachis, is the ancestor from which are derived, on the one hand, *H. vulgare* and its varieties, with tough rachis, and on the other hand, *H. spontaneum*, with brittle rachis. The last-named is the precursor of *H. distichum* and its varieties. *H. irregulare* Åberg and Wiebe has a position intermediate between *H. vulgare* and *H. distichum*.—G. M. R.

BUCKWHEAT

МОДИЛЕВСКИЙ, Я. С. Опыление у гречихи. *Доклады Акад. Наук СССР.* Том 53. № 2, стр. 165-8. 1946.
Modilevskiĭ, Ja. S. **Pollination in buckwheat.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **53.** 161–164. 1946. [Bot. Inst., Acad. Sci. Ukranian S.S.R., Kiev] **230**

Interest in this subject is based on the conception that certain floral traits in *Fagopyrum esculentum* affect yields of this crop. The author has made experiments on pollination accompanied by a detailed embryological examination.—M. H.

LEGUMES

ГУКОВА, М. М. Влияние температуры почвы на фиксацию азота клубеньковыми бактериями. *Труды Сельскохоз. Акад. им. Тимирязева*, 1945. Вып. 30, стр. 33-42.
Gukova, M. M. [**The influence of soil temperature on the fixation of nitrogen by nodule bacteria.**] *Trudy seljskohoz. Akad. im. Timirjazev* 1945. No. 30. pp. 33–43. **231**

Plants of soybean inoculated with nodule bacteria were grown in soils the temperature of which was kept during the day at 19°C. or at 24°C. They were compared with inoculated plants growing in a temperature which was uncontrolled and which rose to about 30°C. during the day. The temperature of both the experimental and control plants was left to vary unchecked during the hours of darkness. It was found that the largest quantity of nitrogen was fixed, and the largest yield of dry matter obtained, at a temperature of 24°C.

Peas were grown under the same conditions as soybean and at controlled temperatures of 15°, 20°, 24°, and 30°C. The uncontrolled temperature rose to 30°C. or higher. The optimal temperature was found to be 20°C. As regards both soybeans and peas, a temperature above the optimal impedes the activity of the nodule organisms far more than one below it.—I. Z.

ФЕДОТОВ, В. С. Задачи селекции зернобобовых культур. *Селек. Семеновод.* 1946. № 3, стр. 22–32.

Fedotov, V. S. [**Problems of selection in grain legumes.**] *Selek. Semenovod.* 1946. No. 3. pp. 22–32. **232**

Grain legumes play an important role in farm and other industries in the U.S.S.R. The need for albumen in feeds for expanding the animal production programme, and also for certain manufactured goods (milk casein for paints, varnishes, artificial fibres, etc.) is stressed. The yield per ha. of albumen from grain legumes is twice as great as from cereal grain. There has been a sharp decline in the area sown to grain legumes in the U.S.S.R. In 1935, the area was 4,612,000 ha. (10 per cent of the world area) but this is now much reduced. Interest is being developed in growing such crops in new areas, notably in the eastern region of the U.S.S.R. Peas occupy a primary place among grain legumes, both in regard to the sown area and gross output. Researches in progress on this crop are described in detail, and there is also information on the cultivation of species of *Phaseolus*, *Vicia*, *Ervum*, *Lathyrus*, and *Cicer*. Agronomic measures necessary for the successful production of such crops are discussed.—M. H.

Daniel, Louise, & Norris, L. C. **The riboflavin, niacin, and thiamin content of dried leguminous seeds.** *J. Nutrit.* **30.** 31–36. 1945. [Cornell Univ., Ithaca, N.Y.] **233**

Tabulated results for *Phaseolus* spp. *Pisum*, *Glycine soja*, *Arachis hypogaea* (17 varieties in all) show that legumes are an excellent source of thiamine and a good source of niacin and riboflavin. The greatest amount of all three vitamins occurs in soybean.—D. B.

Chevalier, A. Amélioration et extension de la culture des Arachides au Sénégal. [**Improvement and extension of the cultivation of the peanut in Senegal.**] *Rev. Bot. appl.* **27.** 173–193. 1947. **234**

An account is given of the British plan for extending the cultivation of *Arachis hypogaea* in East Africa. The situation in Senegal is then discussed as regards research, the progressive aridity of the region, the system of tree fallow, large scale and mechanical cultivation, and the need for social improvements for the cultivators. —D. B.

Donald, D. A. **Peanut cultivation in the Kingaroy district of South Queensland.** *Agric. J. Fiji.* **17.** 73–79. 1946. **235**

There is a full description of the organization of the peanut industry and of cultural measures adopted for production in South Queensland. Dairying is practically the only branch of animal husbandry associated with peanut culture. At present there is little organized crop rotation practised, but a rotation has been recommended for a 10-year period.—M. H.

Norman, A. G. **Who will grow soybeans?** *Iowa Fm Sc.* **1.** 12–14. 1946. **236**

A discussion (with county maps) of the present and possible future location of soybean cultivation in the State of Iowa.—R. O. W.

Revista Agricola, Guatemala. La soya como alimento. [**The soybean** (*Glycine hispida*) **as food.**] *Rev. Agric., Guat.* **2.** Nos. 15–20. 91–96. 1946. **237**

Notes on the nutritive value of the soybean, on varieties grown, and statistical returns on world production.—G. M. R.

Elliott, H. G. **The soybean. Its possibilities in western Australia.** *J. Agric. W. Aust.* **23.** 285–293. 1946. **238**

The origin, climatic and soil requirements, and uses of *Glycine soja* for both animal fodder and oil are discussed. In western Australia soybeans should be sown at a depth of 1 in. in rows 2 to 3 ft. apart after the last spring frost. During trials, the best results have been obtained with Manchu Yellow and Haberlandt varieties. A long list of American and Canadian soybean varieties is also included, and shows the average number of days to maturity, yield per acre, and seed colour in nearly all cases.—M. E. E.

Kerr, J. A. **Field crops. Peanut-growing.** *Qd. Agric, J.* **63.** 325–332. 1946. **239**
See *Herb. Abstr.* 15, Abs. 542.

Great Britain and Northern Ireland, Minister of Food. Cmd. 7030. **A plan for the mechanized production of groundnuts in East and Central Africa.** 1947. pp. 48 (three maps). **240**

The basis of the scheme outlined was submitted by Mr. F. Samuel, Managing Director of the United Africa Co., Ltd., in March, 1946, to the Secretary of State for the Colonies and the Minister of Food. Provision is made for the clearance and planting of 73 units of land in Tanganyika, each 35,000 acres in extent, of which three-sevenths would be under groundnuts, one seventh under an alternative crop, and three-sevenths under a grass ley. On the basis of the importance of the proposal it was considered necessary to send an official mission to East Africa. The report of this mission constitutes the bulk of this publication in which all aspects of the problem are considered. It is now thought that the best and most practicable rotation would be two years' groundnuts, followed by not more than two years' grass. Alternatively, it might be desirable to take a crop of dwarf sorghum after the second year of groundnuts ; varieties have been produced in the U.S.A. which can be harvested by the combine. The stalks or roots could then be ploughed in, and the fourth year might be a grass ley. Sunflower might constitute another course, or this oil-seed crop could be temporarily used in substitution for groundnuts when necessary ; but milling difficulties may be experienced as oil-mills in the U.K. are not equipped to deal with sunflower seeds. Sesame is not a suitable crop for the project, as the pods easily shatter and serious loss of seed would be experienced by mechanical harvesting ; furthermore, this plant yields far less oil per acre than either groundnuts or sunflower. These suggestions should, of course, be tested by the research branch of the project, and the rotation modified in the light of this research. No doubt the mass production of groundnuts could be undertaken immediately with good promise of a satisfactory return.—M. H.

Revista Agricola, Guatemala. Nueces y aceites de mani. [**Nuts and oils of *Arachis hypogaea*.**] *Rev. Agric., Guat.* No. 2. 15–20. 96–100. 1946. **241**

Data and statistics on the world production of groundnuts.—G. M. R.

Walsh, R. M. **What's ahead for soybeans.** *Illinois Fm Econ.* Nos. 142 and 143. 479–483. 1947. [Bur. Agric. Econ., U.S. Dept. Agric.] **242**

The outlook for soybeans over the next 10 or 15 years may be summarized as follows. First, during the next four or five years, the world supply of fats will continue below physical needs based on pre-war standards. Also, the supply of live stock products in Europe will be comparatively low. There will be a strong European demand for soybean meal and soybeans, which will be supplied in part by the United States. But Manchurian soybeans may become a competitor within the next few years. That is uncertain, as the future trade policy for Manchuria is clouded by political disturbances.

Second, there will be a transitional period of another four or five years, when supplies of fats and protein meals will be in better balance with demands. Prices of soybeans will be below present high levels, but above pre-war.

Third, within 10 or 15 years world supplies of oil-bearing materials, and oils and fats, may become excessive if the probable expansion in plantation palm and other oil crops occurs. Prices of soybeans at that time would be depressed. But, whatever the price conditions, it is highly probable that large-scale production of soybeans in the United States is here to stay.
—Quotation.

Walsh, R. M. **Soybean facts.** *Agric. Situation* **31.** 6–7. 1947. [Bur. Agric. Econ., U.S. Dept. Agric.] **243**

American production should again be close to 200 million bushels. Although farmers can expect a fall from present high prices and excess of supply of fats and oils over demand, especially if there is a marked increase in world production from oil palm, groundnut, and coconut, large-scale production of soybeans is likely to continue in the United States. The crop provides valuable foods, much-needed live-stock feed, and material for industrial use.—R. O. W.

Georgia, Agricultural Experiment Station. Bull. 252. **Production and marketing of cowpeas for canning.** By *N. M. Penny.* 1946. pp. 22. **244**

During the past 10 years *Vigna sinensis* has attained importance as a commercial crop. It utilizes farm land that has been taken out of cotton production and the canning of the crop affords opportunity for development of a rural industry. The early crop is planted in spring at the same time as other crops ; the cowpea is then the only crop from that land within that year. A variety for early planting is Groit.

The late cowpea crop is planted in summer, usually in July, after small grains. Clays (local name) is a late variety.

Information for both early and late crops is given concerning preparation of land, planting, cultivating, harvesting, marketing, costs and returns. Apart from its cash value the crop is of great value to the land for soil conservation and soil building. It can also be harvested for hay and for seed.—D. B.

Smith, F. L., Holland, A. H., & MacGillivray, J. H. **Forty-five years of continuous cropping with lima beans.** *Science.* **105.** 179–180. 1947. [Coll. Agric., Univ. California] **245**

The declining yields observed from continuous cropping have generally been with non-legumes ; wheat grown as a monoculture has decreased in yield in California until the practice is no longer profitable. This is not the case with Lima beans, possibly because in the presence of abundant other nutrients the nitrogen supply is replenished by the nodules on the beans.—R. O. W.

Anderson, W. A. **Spring beans.** *J. Minist. Agric.* **54.** 24–26. 1947. [Drumbeg, Co. Down] **246**

Beans are rich in proteins, but they are difficult crops to grow. The author has obtained an average yield of 28 cwt. per acre over the past three years, and describes his methods of production. Early sowing, plenty of farmyard manure and of lime are stressed as important points.—M. H.

Sellschop, J. **Cultivation and harvesting of groundnuts.** *Fmg S. Afr.* **22.** 365–369. 1947. [Coll. of Agric., Potchefstroom] **247**

Instructions are given for harrowing, ridging, harvesting, lifting, gathering and stacking *Arachis hypogaea.* After curing or drying in the stacks, during which two to six week period care must be taken to avoid damage by foot-rot (*Sclerotium rolfsii*), the nuts are picked from the plants by hand or by groundnut threshers.—M. E. E.

Englehorn, A. J., Lawton, K., Meldrum, H. R., & Norman, A. G. **Effect of straw and cornstalks on the yield of soybeans.** *J. Amer. Soc. Agron.* **39.** 89–92. 1947. [Iowa Agric. Expt. Sta., Ames] **248**

No decrease occurred in yield of threshed soybeans after ploughing in straw and maize residues, although it is admitted that the soils used were reasonably high in nitrogen. Incorporation of straw would probably have its greatest effect early rather than during mid-season when the soybean yield is being formed. —R. O. W.

Kerr, J. A. **Canning or navy bean production in Queensland.** *Qd. Agric. J.* **63.** 197–201. 1946. **249**

Amongst the most popular varieties of this summer crop in Queensland is the Michelite canning bean, which matures in 12 to 14 weeks. The best crops are obtained by planting seed 2 to 3 in. deep in rows about 3 ft. apart on well-drained soil. About 15 lb. of seed per acre is required for most varieties, but double this quantity is necessary for large-seeded varieties, such as Pinto. Details of cultivation and harvesting are given which enable the average yields of 12 bushels per acre to be maintained. —M. E. E.

Holmberg, S. A. Från sojaväxtförädlingen vid Fiskeby. [**Soybean breeding at Fiskeby.**] *K. Lantbr. Akad. Tidskr.* **85.** 373–384. [English summary, p. 384.] 1947. **250**

The first aim of soybean breeding at Fiskeby, Sweden, has been to achieve earlier maturity. Varieties which in America and elsewhere are described as "extra-early" do not behave as such when grown in the cool, long-day climate of Sweden. The Canadian variety, Manitoba Brown, which ripens in 100 days at Ottawa, Ontario, on the 45th latitude, requires 143 days on the 58th latitude at Fiskeby, Sweden. The Sioux variety ripens in 85 days in Virginia, U.S.A. (39°), in 114–121 days on southern Sachalin (47°), and in 136 days at Fiskeby (58°). The Giant Green, said to ripen in 109 days in Illinois (40°), is unable to produce fully developed seeds in the climate of Fiskeby. Even the earliest among the soybean varieties obtainable abroad can produce a satisfactory crop in Sweden only in particularly favourable localities.

The first object of breeding work with the soybean was therefore to raise a variety which would ripen in early September in the northern latitudes of Sweden. Attempts to raise such a variety after selection from samples chosen from the most northerly soybean cultivations, met with but little success. Out of 6426 attempted hybridizations, only 872 gave progeny. By crossing the short, extra-early varieties found on the islands of Hokkaido and Sachalin with the taller, medium-early varieties from Manchuria and Germany, new hybrids were raised. Some of these are decidedly earlier in maturity than either of their parents, and are also medium in height. Many of these new hybrids ripen, in the latitude of Sweden, on the first days of September, showing an advance in earliness of 2–3 weeks as compared with the "extra-early" varieties cultivated before. New crosses have been made to increase the yield and improve the quality of these hybrids.—Author's summary.

POHJAKALLIO, O. Sojabönan (*Glycine hispida Max*). [**The soybean** (*Glycine hispida Max*).] *Tidskr. Lantm.* **29.** 62–63. 1947. **251**

Experiments indicate that the soybean varieties available at present are not suitable for cultivation in Finland. The main reason for this is that soybean is a typical short-day plant, which also requires high temperature, particularly after flowering. Breeding is being conducted in Jokioinen with the object of producing varieties suitable for Finnish conditions.—R. P. J.

ŠIMON, J. Výnosnost a jakost zrna odrůd fazolu podle pokusů v letech, 1929–38. [**The productivity and seed quality of varieties of beans according to experiments during 1929-38.**] *Sborn. čes. akad. zeměd.* **14.** 136–145. [German summary, p. 145.] 1939. **252**

Many varieties have been cultivated experimentally, and the average yields of seeds (16–18 q. per ha.) found suitable for field production (15–22 q. per ha.). Fluctuations of yields in different years were large, and low yields were obtained in the dry years of 1934 and 1935. The yields of some varieties were reduced by disease. The tested varieties were divided into four groups according to type of seed, by means of the "Comes system." The four types are: compressed, oblong, elliptical, and spherical. The absolute weight (1000-grain weight) of large beans was 401–710 grm., of medium beans 281–400 grm., and of small beans 134–280 grm. The weight per volume (hectolitre weight) of varieties producing small beans was higher than that of varieties with large beans.

It is advisable to reap the harvest in good time and when the weather is favourable, because the damp weather during ripening and harvesting spoils the quality of seeds in late varieties.

The suitability of beans for human consumption was tested. White beans are preferable for cooking purposes. The amount of husk present was 5·5–9·2 per cent of the bean, and was smaller on large beans, larger on smaller beans.

The results of chemical analyses on five regional varieties showed an average of 23·4–27·5 per cent of crude protein per dry weight of beans, and 1·1–1·5 per cent of crude fat, while two varieties of bushy beans gave 28·2–29·8 per cent of crude protein and only 0·7 per cent crude fat.

Varieties listed are suitable for cultivation in field cultures when growth conditions are considered in addition to yield and cooking qualities. Varieties of *Ph. coccineus* in general gave good yields of beans, but ripened only slowly, and the beans were coarse. Varieties of *Ph. lunatus* were very late, and gave small yields of beans, though of good taste. The only earlier variety with fair yields was Henderson.—K. A. A.

ŠIMON, J. Vhodné odrůdy fazolu pro ruzné účely podle pokusů v 1 1929–38. (Vývoj a vzrůst odrůd.) [**Varieties of beans suitable for various purposes according to experiments made during 1929-38. (Development and growth of varieties.).**] *Sborn. čes. akad. zeměd.* **14.** 126–135. [German summary, p. 135.] 1939. **253**

The observation experiments on many varieties of *Phaseolus vulgaris*, *Ph. coccineus*, and *Ph. lunatus* were made in Brno during 1929–38, with the following results in development and growth. When sown between 2nd and 14th May, the beans grew after 12 (8–15) days, started to blossom in the middle of June, and finished blooming between the end of July and the end of August. The seed became fully ripe between the middle of August and the beginning of October; early varieties of *Ph. vulgaris* usually after 125–130 days; moderately early after 115–126 days; and late after 131–142 days.

Varieties of *Ph. coccineus* were mostly very late (126–162 days) as were also varieties of *Ph. lunatus* (108–169 days). The different types of *Ph. vulgaris* were then divided according to type of plant and colour of pods into low bushy beans with green or yellow pods, tall winding beans or runner beans with green or yellow pods. The most frequent disease was mosaic, to a lesser degree bacterial spot (*Pseudomonas medicaginis* var. *phaseolica*) and anthracnose (*Colletotrichum lindemutianum*). *Tetranychus* damaged some delicate species.

It was evident from the regional varieties that the majority of beans cultivated for use as beans were varieties with white seed of semi-high bushy growth and with green pods. Beans with yellow, black, or red spotted seeds are only very rarely cultivated. The regional types were moderately early varieties and of sound condition.

The harvest of unripe pods began at the end of July and in August. The yields were very good, the majority of varieties averaging between 80–120 q. per ha. in 1938.

For their yield, quality of pods (without fibres), and good growth, the following varieties were chosen for consumption and canning :—

(*a*) Bushy beans with green pods : Saxa, Saxonia, Konserva, Konservanda, Alpha (late), Triumph, Hinrich's Brittle White, Norwegian, Navy (the last suffered from mosaic disease).

(*b*) Bushy beans with yellow pods (waxy) : Sans Rival, Sure Crope, hybrids of F508 and T48 (Prerov), Digoin, Ideal, Brittle Wax, Superba, Butter Queen, Koch, Black Wax (Henderson).

The only good results obtained from runner beans were those producing green pods, like Weddigen and the yellow-podded Phaenomen, Mont D'or. Varieties of *Ph. lunatus* were very late, and only early varieties like Henderson Lima were able to ripen in Moravia.—K. A. A.

ЛЬВОВА, П. Ф. Новые сорта гороха. *Селек. Семеновод.* 1947. № 1, стр. 55-8.
Ljvova, P. F. **[New varieties of peas.]** *Selek. Semenovod.* 1947. No. 1. 55–58. **254**

In the south-eastern part of the Voronež region, the dry period extends from May to September. Because of this, the varieties of peas which ripen early do not have high yields, the critical period of growth corresponding with the dry season. The late-ripening varieties are suppressed by the high temperatures of July or are damaged by pests. Seed yield of these is therefore also poor. There is indication that, for the conditions in this area, varieties which ripen at an intermediate date between the early and late are best. Two new varieties have been produced, namely, Hybrid 413 and Hybrid 1061/4. Both give higher yields than the standard variety, Victoria Mandorf. Details of yields of these two varieties in comparison with the standard are given for the years 1940–44, and the merits of a new variety (Zelenozernyĭ Hybrid 1), produced at the Kamenno-Stepnaja Experimental Station, are also recorded.—M. H.

Reder, R., and others. **Effect of fertilizer and environment on the calcium, phosphorus, and iron content of cowpeas.** *Bull. south Coop. Series.* **4.** 16. 1946. **255**

The investigation was carried out co-operatively by the Georgia, Mississippi, Oklahoma, South Carolina, and Virginia Truck Experiment Stations during the period 1939–42. The data obtained in 23 experiments show that the mineral content of cowpeas (variety Cream Crowder) is not appreciably affected by fertilizer treatment. In contrast, differences between the means of 13 locations were marked, though not accounted for by known environmental conditions.—P. M.

Farm Mechanization. **Machinery for groundnut growing.** *Farm Mech.* **1.** p. 222. 1947. **256**

The East African Groundnut Growing Scheme will involve the highly mechanized agricultural development of some 3,210,000 acres in Tanganyika Territory, Northern Rhodesia, and Kenya. Some details of the necessary equipment are discussed.—M. H.

Lebedeff, G. A. **Studies on the inheritance of hard seeds in beans.** *J. agric. Res.* **74.** 205–215. 1947. [Georgia Agric. Exp. Sta., Experiment] **257**

Soft-seededness (the ability to take up water rapidly) is partially dominant to hard-seededness. Breeding offers the best approach to the problem of eliminating hard-seededness in legumes.—D. B.

Alabama Agricultural Experiment Station. Leafl. 23. **Seed treatment for peanut.** By *C. Wilson.* 1947. pp. 4. **258**

Treatment with disinfectants is more important on machine-shelled than on hand-shelled or unshelled seed of *Arachis hypogaea.* Treatment of the machine-shelled seeds, the coats of which are often damaged, increases the number of plants in the stand by 30 to 50 per cent, but in hand-shelled seeds by only 5 to 10 per cent, because good stands are normally obtained. Spergon and Arasan are reliable disinfectants. Two per cent Ceresan is good, but not the new improved Ceresan, which contains 5 per cent mercury.—D. B.

Milner, M., & Geddes, W. F. **Grain storage studies. III.—The relation between moisture content, mold growth, and respiration of soybeans.** *Cereal Chem.* **23.** 225–247. 1946. [Minnesota Agric. Exp. Sta., Univ. Farm, St. Paul] **259**

When moisture values in *Glycine soja* were below 14 per cent, respiration rate was low and constant. This was purely seed respiration. With increases in moisture value beyond 14 per cent, respiration rate increased. This was due to mould growth, and the plotted respiration values assumed the form of a microbiological growth curve. With increasing moisture content of seed, the latent period of mould spore germination decreased. Frost-damaged seeds were more rapidly attacked by moulds than were sound well-matured seeds.

A moisture value of 14 per cent in soybean corresponded with a relative humidity of 75 per cent in the surrounding atmosphere. *Aspergillus glaucus* began growth at this moisture value, *A. flavus* required a higher moisture value. "Relative humidity rather than actual moisture content of seeds determines their susceptibility to molding. It is concluded that the various 'critical' moisture values for different seed species (e.g. flaxseed 10·5 per cent, wheat 14·5 per cent) are those moisture contents which are in hygroscopic equilibrium with a common relative humidity of about 75 per cent which, over moderate time intervals, is the minimal humidity required for the growth of the most xerophytic mold species which contaminates the seed."—D. B.

MILNER, M., & GEDDES, W. F. **Grain storage studies. IV.—Biological and chemical factors involved in the spontaneous heating of soybeans.** *Cereal Chem.* **23.** 449–470. 1946. [Minnesota Agric. Exp. Sta., Univ. Farm, St. Paul] **260**

Spontaneous heating of sterile seeds in which no microfloral activity had occurred was demonstrated. Chemical changes in the heating seeds, assayed at intervals in the course of the trials, indicated a disappearance of total sugars in the initial biological phase of heating and an increase in reducing substances in the initial spontaneous chemical heating phase. The petroleum ether-soluble fraction remained virtually unchanged in the biological heating stage, but decreased markedly in the chemical heating phase, without a corresponding loss in dry matter content of the seeds.

Respiratory quotients associated with the gas exchange during the spontaneous chemical heating phase suggest the occurrence of thermally induced oxidative cleavage of carbohydrates as well as oxidative polymerization of the seed oils.—Authors' summary.

ANDREWS, F. W. **Parasitism of *Striga* sp. on *Dolichos lablab* Linn.** *Nature, Lond.* **157.** 515. 1946. [Dept. Agric. and Forests, Wad Medani, A.-E. Sudan.] **261**

Full results are to be published elsewhere.

YU, T. F. **A mosaic disease of cowpea (*Vigna sinensis* Endl.).** *Ann. appl. Biol.* **33.** 450–454. 1946. [Inst. Agric. Res., Nat. Tsing Hua Univ., China] **262**

The disease, prevalent in the bean growing regions of China, is described. The cowpea mosaic virus is transmitted by *Aphis rumicis*, *A. gossypii*, and *Macrosiphum pisi*, and is seed-borne. It infects lima bean (*Phaseolus lunatus macrocarpus*) and also Adzuki bean (*Ph. angularis* var. *Chu-Sha*).—M. H.

WRIGHT, D. W., & GEERING, Q. A. **Pea moth.** *J. Minist. Agric.* **54.** 124–129. 1947. [Sch. Agric., Cambridge] **263**

Laspeyresia nigricana is one of the principal pests of field and garden peas in Great Britain. From a study of the susceptibility of different varieties to attack, various recommendations for control by cultivation are suggested. There is also information on chemical control for crops to be picked green and for crops to be harvested dry.—M. H.

MILLER, J. J., HILDEBRAND, A. A., & KOCH, L. W. **Macrophomina and Fusarium attacking field beans in Ontario.** *Sci. Agric.* **27.** 251–259. 1947. **264**

HELY, P. C. **Control of French Bean Fly.** *Agric. Gaz. N.S.W.* 58. 85–89. 1947. **265**

The effects of eight different treatments on bean fly (*Agromyza phaseoli*) behaviour were studied. Harvest yields of Hawkesbury Wonder beans (*Phaseolus vulgaris*) showed that most satisfactory results were obtained by using emulsions containing DDT at concentrations of 0·05 to 0·1 per cent. These DDT sprays are cheaper and easier to handle than the nicotine white oil treatments in present use.—M. E. E.

LOVELESS, A. R., & WESTON, W. A. R. D. **The emergence of "weevilled" beans.** *J. agric. Sci.* **37.** 199–201. 1947. [School of Agric., Univ. of Cambridge.] **266**

Seed treatment with an organo-mercurial dressing had little or no beneficial effect on growth or yield. Experiments showed that emergence of "weevilled" (seeds with conspicuous round holes caused by the larvae of the bean beetle *Bruchus* and not by the bean weevil *Sitona*) beans was markedly less than that of sound beans for both winter and spring sowings, and it is suggested that reduced emergence is due to beetle injury of the seed and not to invasion by soil organisms.—G. M. H.

YU, T. F. **Ascochyta blight and leaf and pod spot of broad bean in China.** *Phytopathology*, **37.** 207–214. 1947. [Univ. Nanking. China] **267**

GARREN, K. H., & HIGGINS, B. B. **Fungi associated with runner peanut seeds and their relation to concealed damage.** *Phytopathology* **37.** 512–522. 1947. [Georgia Exp. Sta., Experiment] **268**

ALABAMA AGRICULTURAL EXPERIMENT STATION. Progr. Rep. Ser. No. 32. **Studies of the control of peanut leafspot.** By *J. P. Wilson* and *C. Wilson*. 1947. pp. 3. **269**

Leafspot on *Arachis hypogaea* caused by *Cercospora* results in losses of two kinds each due to leaf destruction: total yield of nuts is reduced, and nuts are shed more quickly in the soil. Control of leafspot by dusting with sulphur or sulphur-copper mixtures has resulted in an increase in yield of 200 to 300 lb. per acre (the higher figure being obtained with sulphur-copper mixtures) and since shedding of peanuts was reduced, the harvesting period was extended by one or two weeks. The dust is applied at the rate of 30 lb. per acre at two-week intervals, beginning when the plants are about 65 days old. Results on runner peanuts have been less consistent than on Spanish peanuts.—D. B.

WILSON, C. **Concealed damage of peanuts in Alabama.** *Phytopathology* **37.** 657–668. 1947. [Alabama Agric. Expt. Sta., Auburn] **270**

Concealed damage of peanuts is a type of seed decay that begins on the inside of the seed and is not visible until the seed is broken open. The damage develops fastest in peanuts containing 15 to 35 per cent moisture. Above and below this moisture level the development is slower. If the peanuts have 10 per cent or less moisture when they are stored, the disease makes no appreciable progress.

The disease appeared to be most common on land that is cropped to peanuts continually. The fungus most frequently isolated from damaged seeds is *Diplodia theobromae*. After the seed reaches an advanced stage of decay, species of *Fusarium* and *Penicillium, Sclerotium bataticola*, and other soil-inhabiting fungi appear. It was found that windrow-cured peanuts, as a rule, contain less concealed damage than stacked or cocked peanuts, and the disease is usually unimportant in Spanish peanuts. A new variety of runner peanuts, Dixie Runner, appears to be rather resistant to the disease.—P. M.

LUTTRELL, E. S. *Diaporthe phaseolorum* **var.** *sojae* **on crop plants.** *Phytopathology* **37.** 445–465. 1947. [Georgia Exp. Sta., Experiment] **271**

HILDEBRAND, A. A., & KOCH, L. W. **Observations on bud blight of soybeans in Ontario.** *Sci. Agric.* **27.** 314–321. 1947. **272**

The blight was caused by a virus that belongs to the group of tobacco-ringspot viruses. As the acreage of soybeans in southwestern Ontario has increased, so also has the prevalence of the blight.

Some symptoms are: distortion, brittleness, and necrosis of the shoot tip, yellowish discoloration, wrinkling, and often necrotic stippling of young and bronzing of older leaves. Blight occurs on buds and blossoms, and pods are reduced in size and number. If infection occurs early in the season, the plant growth is arrested; if later, the plants remain green until late into autumn.

Of 2489 plants grown from seed from bud blight-infected plants, only 0·52 per cent developed symptoms of the disease. Among 38,994 plants grown from general-run seed or from bud blight-free plants, only 0·15 per cent showed blight infection. Evidence of seed-borne nature of the diseases is therefore of doubtful significance.—P. M.

REEVE, R. M. **Ontogeny of the sclereids in the integument of** *Pisum sativum* **L.** *Amer. J. Bot.* **33.** 806–816. 1946. [Western Reg. Res. Lab., Albany, Calif.] **273**

The macrosclereids and osteosclereids in the testa of *Pisum sativum* are derived from a well-defined protoderm in the young ovule. The stages of differentiation are traced in the development of each of these tissues. The sclereids in *Pisum* are compared with those in other legumes. The relationships of histological structure and cell wall composition to tissue texture are briefly discussed.—D. B.

LAMPRECHT, H. En-, två- och treblommighetens praktiska betydelse vid förädlingsarbete med ärter. [**The practical importance of one- two- and three-flowered types for breeding work with peas.**] *Agri. Hort. Genet.* **4.** 79–98. [English summary, pp. 97–98.] 1947. **274**

Preliminary investigations show that genetically two-flowered lines, characterized by great earliness and slight growth, usually develop only one flower. On an average, the lowest yield is found in mainly one-flowered plants. There does not appear to be any possibility of increasing yield of peas by substituting a three-flowered type for a two-flowered type.—M. H.

ШМАРГОНЬ, Е. Н. О частичной стерильности *Arachis hypogaea* L. *Доклады Акад. Наук. СССР.* Том. 54. № 8, стр. 743-5. 1946.

ŠMARGONJ, E. N. **On partial sterility in** *Arachis hypogaea* **L.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **54.** 739–741. 1946. **275**

Partial sterility in this species affects up to two-thirds of the total number of flowers. It is caused by the failure of fertilization and by the checked development of the gynophore bearing the fertilized ovary, the restriction being due to unfavourable conditions of temperature, moisture, and darkness.—M. H.

FULTS, J. L., & PAYNE, M. G. **Secondary root stimulation in the common bean, *Phaseolus vulgaris* L., caused by the insecticides DDT and Colorado 9.** *Bull. Torrey bot. Cl.* **74.** 112–114. 1947. [Colorado Agric. Exp. Sta., Fort Collins] **276**

Further studies are needed to determine whether or not DDT may be used at high concentrations in the soil to increase the extent of plant root systems under field conditions. Such increased root systems might result in accelerated moisture and nutrient absorption and top growth.—Authors' summary.

TRUOG, E., GOATES, R. J., GERLOFF, G. C., & BERGER, K. C. **Magnesium-phosphorus relationships in plant nutrition.** *Soil Sci.* **63.** 19–25. 1947. [Univ. Wisconsin] **277**

Field and culture experiments were conducted on *Pisum sativum.* Chemical analysis showed a strong correlation between phosphorus content and magnesium nutrition. The results support the theory that magnesium functions as a carrier of phosphorus. The importance of an adequate magnesium content of the soil in order to obtain crops high in phosphorus, and therefore, of high nutritive value, is stressed.—D. B.

ФЕДОРОВ, М. В. Влияние органических веществ на образование клубеньков у гороха в условиях монобактериальной водной культуры. *Труды сельскохоз. Акад. им. Тимирязева* 1945. Вып. 30, стр. 43-56.
FEDOROV, M. V. [**The influence of organic substances on the formation of nodules on peas grown in a monobacterial aqueous culture.**] *Trudy seljskohoz. Akad. im. Timirjazev* 1945. No. 30. pp. 43–56 **278**

Inoculated peas were grown in aqueous nutrient media of which nitrogen in various amounts was among the constituents. The formation of root nodules proceeded slowly, even if a medium contained the full complement of nutrient elements, unless aspartic acid, glucose, extract of powdered oat straw, or extract of powdered pea haulms were also present in the medium. The nodule bacteria may be present in the medium and in the plant, but they will not form nodules vigorously unless various organic substances, such as those mentioned above, are at hand to supply them with the materials necessary for their activity. When peas and maize were grown together, the roots of the latter failed to give off enough substance to stimulate nodule formation in the peas, unless the conditions were such as would favour an abundant growth of maize and particularly of its roots. The nature of the stimulating substances is not yet well understood.—I. Z.

VIRTANEN, A. I., & LINKOLA, H. **Competition of Rhizobium strains in nodule formation.** *J. Microbiol. Serol.* **12.** 65–77. 1947. [Biochem. Inst., Helsinki] **279**

The fact that nodule formation is first caused by an ineffective strain, H VIII, makes it impossible for effective strains to produce subsequent nodulation within the period during which nodules usually appear on uninoculated plants. It is thought that the strain first to enter the roots immunizes the plant against other strains, and that this immunity decreases with age of plant. A new technique based on a branched tube system is described.—R. O. W.

THORNTON, H. G. **The biological interactions of Rhizobium to its host legume.** *J. Microbiol. Serol.* **12.** 85–96. 1947. [Rothamsted Expt. Station] **280**

The intensive study of the symbiosis of *Rhizobium* and its legume host-plant has emphasized how delicate is the equilibrium upon which a satisfactory association depends. The effectiveness of the bacterial strain for a particular host plant, the genetic stability of this strain, and its ability to compete with other strains in the soil may all influence the growth of the crop. The plant begins to exert its influence on the bacteria by root secretions before they infect the roots, and both the degree of infection and the activity of the nodules that are formed, will be influenced by genes in the plant as well as by environmental conditions that affect its physiology. It is the separation of these complex factors that is at once the main difficulty and the chief fascination in the study of this symbiosis.—Author's conclusion.

PAYNE, M. G., & FULTS, J. L. **Some effects of 2,4-D, DDT, and Colorado 9 on root nodulation in the common bean.** *J. Amer. Soc. Agron.* **39.** 52–55. 1947. [Colorado Agric. Expt. Sta., Fort Collins] **281**

The first two substances depressed nodulation, but Colorado 9, an insecticide similar to DDT, did not depress nodulation of *Phaseolus vulgaris* even at relatively high concentrations.—R. O. W.

WAI, K. N. T., BISHOP, JEAN C., MACK, PAULINE B., & COTTON, R. H. **The vitamin content of soybeans and soybean sprouts as a function of germination time.** *Plant Physiol.* **22.** 117–126. 1947. [Pennsylvania State College, State College] **282**

Analyses for carotene, thiamin, riboflavin, niacin and ascorbic acid on the dry bean and the soaked and sprouting bean of the Bansei variety showed increases in these vitamins (except thiamin) throughout a 54-hour germination period. Sprouting, therefore, increases nutrient value. After 54 hours of germination, hypocotyl and cotyledon were analysed separately since, in Eastern countries, only the hypocotyl is eaten and the cotyledon discarded. The results of the analysis do not support the practice because the cotyledons contain much greater amounts of all vitamins than do the hypocotyls.—D. B.

Johanson, R., & Lugg, J. W. H. **Sulphur distributions, with special reference to the cystine plus cysteine and methionine contents of the seeds and seed proteins of two varieties of soya beans.** *Aust. J. Exp. Biol. med. Sci.* **24.** 321–325. 1946. [Univ. of Melbourne] **283**

Seeds of the Dunfield and Lincoln varieties were examined for their sulphur distributions. The cysteine and methionine contents of the "whole" proteins were very similar in both varieties. In terms of the nitrogen present the seeds and seed proteins appeared rather low in methionine content, and could not be regarded as high in nutritive value, although they were superior to many other legume seeds in this respect.—M. E. E.

Smiley, W. G., & Smith, A. K. **Preparation and nitrogen content of soybean protein.** *Cereal Chem.* **23.** 288–296. 1946. [Northern Reg. Res. Lab., Peoria, Illinois] **284**

"Soybean protein" refers to the curd which is precipitated from an aqueous or alkaline extract of soybean meal by addition of acid. The nitrogen content of the curd varies, but the variations between varieties of *Glycine soja* are small compared with those due to method of preparation of the curd.—D. B.

Flentje, N. T. **Poor emergence in peas.** *J. Dept. Agric. S. Aust.* **50.** 246–249. 1946. [Waite Agric. Res. Inst., Adelaide] **285**

Poor germination of wrinkled seeded peas in the field is due to rotting of some seed shortly after sowing through fungus attack. Rotting is worst on wet soils and where two or more crops are grown. Control measures are: planting in fairly dry conditions, sowing only once in five years on same land, and treating all seed with Tetroc (2 oz. per bushel) before sowing.—R. O. W.

Eastwood, Alice. **A tentative key to the small-flowered lupines of the western United States.** *Leafl. West. Bot.* **4.** 217–222. 1946.
Eastwood, Alice. **A tentative key to the small-flowered lupines of the western United States.** *Leafl. West. Bot.* **4.** 251–254. 1946. **286**

Eastwood, Alice. **Species of the *Lupinus lepidus* group.** *Leafl. West. Bot.* **4.** 281–284. 1946. **287**

In Jepson's "Flora of California," several varieties are recorded as belonging to *Lupinus lepidus*. Eastwood considers these to be distinct species, and supports her claim with notes of these plants and a key.—D. B.

Eastwood, Alice. **A group of lupines related to *Lupinus onustus*.** *Leafl. West. Bot.* **4.** 41–43. 1944. **288**

The following lupins are described, and a key for their indentification is given: *Lupinus onustus*, *L. mucronulatus*, and *L. violaceus*.—D. B.

Eastwood, Alice. **A new lupine from Mt. Rainier.** *Leafl. West. Bot.* **4.** 43–44. 1944. **289**

Lupinus rainierensis spec. nov. is described. A key is given to show how it may be distinguished from related species.—D. B.

Eastwood, Alice. **Tentative key and discussion of the lupines with spurred calyx.** *Leafl. West. Bot.* **4.** 186–194. 1945. **290**

A tentative key is produced to distinguish 12 species of *Lupinus*, each of which is described. This group of lupins with spurred calyx extends from the Pacific Coast to the Rocky Mountains and from beyond the northern boundary of the United States to the southern. —D. B.

Mackie, W. W. **Origin, dispersal, and variability of the Lima bean, *Phaseolus lunatus*.** *Hilgardia* **15.** 1–24. 1943. [Received 1947.] [Calif. Agric. Expt. Sta., Berkeley] **291**

The history of the development and cultivation of lima beans in pre- and post-Columbian times is presented, and many kindred species are also described. Genetic evidence and cytological evidence unite to point to a single species of *Ph. lunatus*, and this unity is further supported by the diseases and pests specific to all the bean types and by the characteristic lima-bean flavour imparted by two enzymes. The nomenclatural history and present taxonomic status of various species are noted, and there are coloured plates of beans belonging to the Hopi, Carib, and Inca branches of dispersal.—M. E. E.

LAMPRECHT, H. Studien über die Zeitigkeit bei *Pisum* 1. Die Begriffe Zeitigkeit und Lebensdauer. [**Studies on the earliness of *Pisum* 1. The conceptions earliness and duration of life.**] *Agri. Hort. Genet.* **4.** 105–118. [English summary, p. 117.] 1947. **292**

From a study made in twenty-six cultivated and five spontaneous varieties of *Pisum sativum* of various characteristics of earliness, such as flowering time, harvest time of the first green pod, and time of seed ripening, it is concluded that early-flowering varieties can have either a short or long duration of life. The greatest differences regarding duration of life are found between the geographical varieties *abyssinicum* and *asiaticum*, the former having the shortest, and the latter the longest, duration of life.—M. H.

OIL CROPS

LONDON (COLONIAL OFFICE). **Report of the mission appointed to enquire into the production and transport of vegetable oils and oil seeds produced in the West African Colonies.** Colonial No. 211. 1947. pp. 76. **293**

The problems affecting the production and export of oilseeds in West Africa fall naturally into three categories: agricultural, economic, and transport. Of necessity, however, there is considerable overlapping, and in order to avoid repetition the Report is divided into four main sections. The first deals solely with the agricultural factors, largely common to all four Colonies, which affect the growth of the principal crops under reference; the second with the production and development problems to be found in each Colony and the recommendations made for dealing with them; the third with the economic and commercial problems which, again, are largely common to all the Colonies; and the fourth purely with transport.—From Introduction.

ANDERSSON, G. Resultat och erfarenheter från 1946 års oljeväxtodling. [**Cultivation of oil crops in 1946: results and experiences.**] *Lantm. Svenskt Land* **31.** 349–351. 1947. **294**

The total oil crop area in Sweden in 1946 was 27,000 ha., a reduction of 10,000 ha. compared with 1945, and of 17,400 ha. compared with 1944. The reduction has been most marked in the province of Scania, where it amounted to 8500 ha., or approximately one-third of the 1945 area. This diminished interest in the cultivation of oil crops is to be attributed in part to severe attacks by insect pests and in part to the great reduction in the prices paid for certain kinds of crops. Compared with 1945, autumn rape has given a better yield, but oil flax throughout the whole of Sweden has given a very poor yield, the poorest since the initiation of oil crop cultivation. In the areas where attacks by insects were of moderate severity, such as in Östergötland and on Gotland, the oil crop harvest was relatively satisfactory, but the yields obtained by many growers in Scania are not sufficient to cover production costs.—R. P. J.

HILL, A. G. **Oil plants in East Africa.** (1) **Groundnuts,** (2) **Sesame, and** (3) **Sunflowers.** *E. Afr. Agric. J.* **12.** 140–152. 1947. [Director, E. African Agric. Research Inst.] **295**

Groundnuts.—Groundnuts, introduced into Africa from Brazil some four centuries ago by the Portuguese, is a crop of increasing importance to man, its main use being in the production of groundnut oil, used in the manufacture of margarine, cooking and salad oils. Inedible grades of the oil are used chiefly by the soapmaker. In East Africa the crop is widely grown by natives, but has never appeared to attract the European farmer although suitable land is available in many areas. There are three main types: (i) the bunch, or upright, (ii) the creeping, or prostrate, and (iii) a type not often seen, where the branches are procumbent but with their ends turned upwards. Light, sandy, well-drained loams, not too rich in organic matter, are the best groundnut soils.

The cultivation, harvesting and shelling, diseases and pests, and the economics of groundnuts in East Africa are discussed. In view of the fact that India, which before 1939 was the greatest exporter, is unlikely ever to resume its groundnut export trade on the pre-war scale, it is thought that the world demand for African groundnuts is likely to be keen for years to come. The expansion of the industry to East Africa seems to be largely a matter of manpower and economic transport.

Sesame.—Sesame probably originated in Africa since its allied wild species are found only in this continent. The seed is chiefly valued for its excellent edible oil, used for culinary purposes and in the manufacture of margarine, salad oils, shortenings, etc. Exports do not reach a high figure since the crop is used with groundnuts and coconuts to provide the oil portion of the African's diet. For commercial purposes, sesame is broadly divided into white- and black-seeded types, the former commanding the higher price.

Notes on crop improvement, soil, and climatic requirements, cultivation methods, yields, storage, oil extraction, and economics follow. The yield from sesame is only about one-third that of groundnuts whereas the price of the product is not correspondingly greater. It is unlikely that sesame will ever be grown in East Africa by European farmers until the problem of excessive loss of crop through the shedding of seed during harvesting operations is solved.

Sunflower.—The sunflower is not grown extensively in Africa. It is grown for its seeds which yield an excellent edible oil while the residue left after the extraction of the oil makes a first-rate protein cattle cake. Although not of tropical origin, the sunflower thrives at medium and high elevations in the tropics and can usually be grown where maize succeeds.

The sunflower seems to be a possible alternative crop for certain parts of the country but whether sunflower seed will ever be a profitable export crop must depend on world prices and the relative yield and cost of production in East Africa as compared with other producing countries. Cultivation, harvesting and threshing methods are also discussed, together with an account of crop yields and diseases and pests.—G. M. H.

KUZELKA, T. J. **More mustard for food—and oil.** *Agric. Situation* **31.** 7. 1947. [Bur. Agric. Econ., U.S. Dept., Agric.] **296**

American farmers last year produced about 43 million lb. of mustard seed, chiefly in Montana (90 per cent) and California. The big demand has come from users of mustard oil for industrial purposes.—R. O. W.

MENDES, P. T. A cultura do girassol no Uruguai e na Argentina. [**Cultivation of the sunflower** (*Helianthus annuus*) **in Uruguay and Argentina.**] *Rev. Agric., Piracicaba* **22.** 189–194. 1947. [Chief, Section for Oil Plants, Agron. Inst., Luiz de Queiroz Agric. Coll., Univ. S. Paulo, Brazil] **297**

Impressions of a tour. *Uruguay.*—Breeding work at La Estanzuela and at Montevideo is described. Area under sunflowers (considerably increased during the last 10 years): 80,000 to 100,000 ha. Average yield (has tended to fall with the increase in total area) : 700 to 800 kg. per ha., but 1500 kg. per ha. can be achieved with good technique. Selected seed from La Estanzuela is available. *Argentina.*—Before 1939 only Russia exceeded Argentina in importance as a sunflower-growing country, but since then the Argentine sunflower area has been more than doubled. Cultural technique is advanced and largely mechanized ; yields per unit area have increased. Breeding is in progress at the Pergamino Experiment Station, largely on the basis of Russian material. Harvesting methods are described.—G. M. R.

BERTRAN, CL. La moutarde noire. [**Black mustard.**] *Potasse* **21.** 20–22. 1947. **298**

A general account is given of the cultivation of mustard throughout the world, and a detailed account is given for France. Mustard seed was formerly imported for the pharmaceutical industry from Rumania and Russia (*Brassica juncea*), and for the condiment industry from India (*B. nigra*).

Only three varieties are cultivated in France, namely, Roumania, Montana, and Alsace. Seed of Roumania, when grown in France, is inferior to that grown in Rumania. When grown in France, this variety has a bitterness which may be due to harvesting before maturity or to contamination with charlock (*Sinapis alba*), which is widespread in France. Montana, a yellow-seeded variety, was imported from America in 1946. Regions of beet cultivation are suitable for this variety. Alsace is a high-yielding variety.

Information is given on preparation of the ground, place of mustard in the rotation, sowing, manuring, methods of harvesting, storage, and control of insect pests.—D. B.

SMITH, E. G. **The linseed crop.** *N.Z. J. Agric.* **73.** 459–464. 1946. **299**

The world's chief producers of linseed are Russia, India, Argentina, Canada, and U.S.A. The area devoted to this crop in New Zealand has varied considerably from year to year, chiefly because of price fluctuations. However, with the present assured market probably the area sown in linseed will become more stable, and in many districts it will be looked upon as an important crop in the rotation.—Quotation

SELLSCHOP, J., & DU TOIT, J. J. **The production of sunflowers.** *Fmg S. Afr.* **22.** 633–637. 1947. [Coll. of Agric. Potchefstroom.] **300**

It is expected that the strong demand for sunflower seed which has prevailed during the world shortage of oil-bearing seeds will decrease as the cultivation of groundnuts increases. Sunflower seed is not popular with oil-expressers because the seed has to be decorticated at the factories. All aspects of cultivation and production of sunflower seeds are discussed.—G. M. H.

THOMAS, W. J., & ROBERTS, M. B. **Some experiences in growing linseed for feed on Welsh farms.** 1946. pp. 9 [Mimeographed] **301**

Notes on the agronomy, feeding value,

costs of production, and yields of a crop which represents a minor war-time development in Welsh agriculture, and which it is considered deserves more attention as a source of emergency fodder.—R. O. W.

Knapp, O. Sonnenblumenzüchtung in Ungarn. [**The breeding of** *Helianthus annuus* **in Hungary.**] *Züchter* **12.** 193–199. 1940. [Received 1947.] [Felsöireg, Transdanubia, Hungary] **302**

Objectives include uniformity of type, increased seed yield, increased proportion of kernel in the seeds, the production of a one-flowered type, strength of stem, earliness in the shorter sunflower types, resistance to insect pests. The colour of the hypocotyl (dark-red, violet, or colourless) may possibly serve as a basis of selection.—G. M. R.

Sessous, G., & Schell, H. Ergebnisse mehrjähriger Rapskulturversuche. [**Results of long-duration rape** (*Brassica napus*) **trials.**] *Forschungsdienst* **9.** 367–369. 1940. [Received 1947.] [Inst. Pflanzenbau u. PflZüchtg., Univ. Giessen] **303**

The conclusions reached from trials of different cultural practices, already reported elsewhere (see *Herb. Abstr.* 10, Abs. 162, 1940), are summarized. They are concerned with scarifying (leads to reduced yield), transplanting (not recommended), singling (leads to diminished rather than increased yield, especially when carried out late), seeding rate (approximately 6 kg. per ha. under normally good conditions), drill width (approximately 40 cm.), manurial treatment (the value of nitrogenous fertilizer is stressed).—G. M. R.

Etchecopar, J. A. El mejoramiento del girasol en la Argentina. Breve reseña histórica de su cultivo. [**The breeding of** *Helianthus annuus* **in Argentina. Short historical account of its cultivation.**] *Rev. argent. Agron.* **14.** 43–49. 1947. [Est. Exp. Pergamino, Min. Agric., Argentina] **304**

The sunflower is of increasing importance in Argentina, chiefly as an oil plant, and occupied 1,616,000 ha. in 1945–46. Selection from Leningrad material began at Pergamino in 1939 and has produced the variety Saratov Pergamino, approved by the Argentine Seed Control Tribunal in 1945. It is characterized by earliness, reduced height, lack of tendency to shed seed, uniform ripening, and oil content good in quantity and quality. Selection has been intensified since 1944, and crossing began in 1943. Tabular information on the hybrids produced, including the white-grained variety AK × the striped-grained variety Saratov Pergamino, shows the percentage kernel to hull, thousand kernel weight, percentage oil/dry matter, the height of the plants, and the diameter of the heads. Results to date have demonstrated the possibility of increasing the proportion of seed and oil.—G. M. R.

ДЕМИДЕНКО, Т. Т. и БАРИНОВА, Р. А. Влияние азотобактериального удобрения на урожай подсолнечника и клещевины. *Доклады Акад. Наук СССР.* Том 54. *№* 6, стр. 549-51. 1946.

Demidenko, T. T., & Barinova, R. A. **Influence of Azotobacter fertilizer upon the yield of sunflower and castor bean.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **54.** 545–547. 1946. **305**

All crops do not respond to *Azotobacter* fertilizers in the same way, depending on various factors, but when applied with P and K to sunflower and castor bean on loams of the Nuhino-Zakately Valley in Azerbaĭdžan there is a positive effect on growth and development of these plants.—M. H.

Andersson, G., & Björklund, C. M. Skördetidsförsök i höstraps och vitsenap sommaren 1944. [**Time of harvesting trials with autumn rape and white mustard in the summer of 1944.**] *Sverig. Utsädesför. Tidskr.* **55.** 20–25. 1945. **306**

One trial was carried out with autumn rape and one with white mustard. In both trials four harvesting dates were tested. In the trial with autumn rape, the dates of cutting were 12th, 18th, 24th, and 30th July. There was a considerable increase in seed yield from the first to the second harvesting date. From the second to the third cut there was a slight reduction in yield of seed; the yield at the fourth harvesting date was considerably less than at the third. The fat content and the yield of fat per ha. show an increase from the first to the second cut; the acid number was constant throughout the trial. The content of crude protein was also fairly constant during the course of the trial.

In the trial with white mustard, the dates of cutting were 7th, 13th, 19th, and 28th August. The seed yield rose up to the third harvesting date. Increases in the ha. yields in the second and third harvestings are very large. The fat content of the seed is increased from the first to the second cut by 4 per cent, after which it remains constant. The acid number and the crude protein content were the same at all the cutting dates.—R. P. J.

PEARKS, J. W. **Harvesting linseed.** *Farm Mech.* **1.** p. 252. 1947. **307**

Linseed flax ripens unevenly and has to be cut when the straw has turned yellow. Cutting can be done with a grass mower with a clover attachment fitted. An ordinary threshing drum deals with linseed successfully if a $\frac{1}{4}$ in. or $\frac{3}{16}$ in. sieve is fitted in the primary cleaning shoe and the smallest sieves put in the secondary cleaning shoe. The wind on both shoes has to be much reduced. Direct combining of linseed is not advisable. The windrow and pick-up method is usually adopted.—M. H.

CORMACK, R. G. H. **A comparative study of developing epidermal cells in white mustard and tomato roots.** *Amer. J. Bot.* **34.** 310–314. 1947. [Univ. Alberta, Edmonton, Canada] **308**

In white mustard (*Brassica alba*) the root cap tissue persists; the epidermis at the meristem is differentiated into alternating rows of long and short cells; the short cells vacuolate later than the long cells, and at maturity they form hairs while the long cells remain hairless. In tomato (*Lycopersicum esculentum*) the root cap is non-persistent; the epidermal cells are undifferentiated and do not form hairs so readily. Transverse sections show that these differences in root epidermal cells are accompanied by different arrangements of cortical cells, by time, origin, size, shape, and extent of intercellular spaces, and by duration of root cap tissue. The view is advanced that the anatomical condition in white mustard is a result of outward diffusion of food materials. The condition of the epidermis of the root of *Zea mays* is similar to that in *Brassica alba*.—D. B.

ЩЕГЛОВА, О. А. Значение длины дня при продвижении южной масличной культуры перилльı (*Perilla ocymoides* L). на север. *Сборник Наук. Работ, Бот. Инст. им. Комарова Акад. Наук СССР.* 1941-3, стр. 221-31, Ленинград, 1946.

ŠČEGLOVA, O. A. [**The importance of daylength for extending further northward the cultivation of a southern oil plant** (*Perilla ocymoides* L.).] *Sbornik Nauč. Rabot, Bot. Inst. im. Komarov Akad. Nauk. S.S.S.R.* 1941–43. pp. 221–231. 1946. **309**

Experiments were made in Leningrad during 1941 with *P. ocymoides* seedlings at the stage of production of four leaves. The plants were exposed to daylight for 9, 10, 11, 12, 13, and 14 hours during the period of 15, 20, and 25 days, and were then planted in the open ground, growing under normal daylight for the remainder of the vegetative period. Only those plants which were exposed to a 9–13 hour day for 25 days produced normal inflorescences and seeds; in plants exposed to the same amount of daylight for 15 and 20 days only, single flowers appeared and no seeds were produced; no flowering occurred in controls. In the first group (25 days) the length of the stem varied from 35 to 90 cm., and the inflorescences were abundant in those plants which had a stem of 35–44 cm. (9–13 hour daylight); there were only single flowers in the 14 hour plants of the same group, and their stems averaged 90 cm. In the other two groups (15 and 20 days) the stems averaged 120–140 and 92–120 cm. respectively, while in controls stem length was 155 cm. In another experimental series, the plants, at the four-leaf phase of development, were exposed to 10 hours daylight for a period of 10, 15, 21, 22, 23, 24, 25, and 26 days. Growth of the stem ceased earlier in those plants which were exposed for 21–26 days, and such plants flowered earlier and had more abundant inflorescences than either the other plants or the controls. The seeds in plants that began flowering at the end of July ripened at the end of August, weighed 5·0 grm. per 1000, and contained 45–48 per cent of oil.—H. F.

SEN, B., & CHAKRAVARTI, S. C. **Vernalization of excised mustard embryo.** *Nature, Lond.* **159.** 783–784. 1947. [Vivekananda Lab., Almora, India] **310**

In contrast to vernalized wheat and rye, vernalized unsplit mustard seed (*Brassica juncea*) does not become devernalized under high temperature (*Herb. Abstr.* 16, Abs. 893). Tests have been undertaken with mustard *T*.102 to determine whether (1) embryos excised from dried vernalized unsplit seeds would produce vernalized plants, and (2) whether the effects of chilling excised embryos of mustard in different media would be similar to those observed by Gregory and Purvis (*Herb. Abstr.* 8, Abs. 741) and Purvis (*Herb. Abstr.* 15, Abs. 333). Details of the results are to be published elsewhere.—M. H.

ЧАЙЛАХЯН, М. Х. О природе задерживающего цветение действия листьев. *Доклады Акад. Наук СССР.* Том 55. № 1, стр. 73-6. 1947.

ČAĬLAHJAN, M. H. **On the nature of the inhibiting effect of leaves upon flowering.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **55.** 69–72. 1947. [Timirjazev Inst. Pl. Physiol., Acad. Sci., Moscow] **311**

See also *Herb. Abstr.* 17, Abs. 1438 and 1439. The photoperiodic reaction of plants when some of their leaves are placed under conditions of long day and others of short day is the cumulative effect of the opposed action of these leaves. The experiments with *Perilla* sp. described were designed to determine the nature of the inhibitory action of the leaves on flowering. It is concluded that the inhibitory action of long-day leaves in short-day plants is based on the action of assimilates (sugars) produced in the leaves and transported to the stem buds. The inhibitory effect of short-day leaves in long-day plants is connected with the production by these leaves of nutritive substances other than sugar.—M. H.

VEIHMEYER, F. J., & HENDRICKSON, A. H. **Soil density as a factor in determining the permanent wilting percentage.** *Soil Sci.* **62.** 451 456. 1946. [Univ. of Calif., Davis] **312**

Compacted gravelly loam soil was used in the experiment to determine whether sunflower plants could penetrate it even though grapevines in the field and native vegetation had failed to do so. The failure of the sunflowers in these laboratory trials to extract moisture by the roots from soil with specific gravity of 1·8 or above showed that moisture equivalents are sometimes an unreliable measure of the field capacity, as in the case of this soil, which would take five months to drain. These results indicate the importance of compactness and size of pores as factors tending to accentuate the discrepancies between field and laboratory determinations of the moisture properties of certain soils.—M. E. E.

МЕЛИКЯН, Н. М. Влияние продолжительности дневного освещения на анатомическое строение стебля подсолнечника. *Доклады Акад. Наук СССР.* Том 53. № 9, стр. 857-9. 1946.

MELIKJAN, N. M. **Anatomical structure of stem in sunflower as influenced by period of diurnal illumination.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **53.** 851–853. 1946. (V.M. Molotov State Univ., Erevan] **313**

When the short-day sunflower is kept under long-day conditions and does not achieve blooming until the beginning of June, no cambium is formed between the vascular bundles, the latter being evenly distributed. A different condition is observed in plants at the stage of flower-bud formation kept under short day. The cambium is formed between the bundles and fuses with that enclosed within the bundles. A regular cambium ring is formed which is lacking in stems of control plants grown under long day. Towards the beginning of September the plants kept under long day had reached the stage of flower bud formation, and cambium had formed between the bundles, but there was no secondary xylem, whereas plants under short day were setting fruit and vessels of secondary xylem were formed in great numbers.

At the beginning of the growing period when both the control and the experimental plants are at the stage of vegetative growth, there are no changes in anatomical structure. When plants which are kept under shortened day pass from vegetative growth to reproductive development there are differences in the stems of the two groups of plants. The formation of cambium between the bundles occurs only in stems of plants which pass from vegetative growth to flower bud formation and flowering. Short day enhances the activity of cambium and thus the onset of flowering is accelerated. In plants grown under natural day, these phenomena occur later towards the end of October when the duration of natural day is reduced to 12 hours.—M. H.

ALAM, Z. **Refining and scenting of sarson oil.** *Indian Fmg* **7.** 402–404. 1946. **314**

Sarson (colza) oil is obtained by hot or cold expression from the seeds of two forms of sarson (*Brassica campestris* var. *dichotoma* and *Brassica trilocularis*). Its uses are mentioned, and a new method of refining is described. Notes on bleaching, deodorization, scenting, and colouring are given.—M. E. E.

ANDRÉ, E., & KOGANE-CHARLES. Contribution à l'étude de quelques graines de crucifères à huile. [**Some oil-bearing crucifer seeds.**] *Ann. agron., Paris* **16.** 423–433. 1946. [Lab. corps gras I.N.A. Paris] **315**

A chemical examination was made of seeds of *Brassica napus* var. *oleifera*, *B. campestris*, *Camelina sativa*, and *Sinapis alba*. The two *Brassica* species are the best oil-bearing plants for temperate countries. In France, the winter variety of *B. napus* var. *oleifera* produces the highest yield per acre of oil. Data are given on the oil content of this seed and physical and chemical properties of the oil. Several varieties were examined. Owing to the presence of a sulphur compound, the oil of *Brassica* seeds is bitter and has an offensive smell, and therefore cannot be consumed directly. *C. sativa* and *S. alba* are good spring oil plants ; *C. sativa* matures in 100 days and is able to resist heat and drought. Early sowing (April), however, results in higher yields of oil than does late sowing (June). May sowings give intermediate yields of oil. *S. alba* produces an oil more agreeable to the taste than that of *C. sativa*. *S. alba* is much used as a forage plant in France. When grown for this purpose it should be harvested before any seeds are formed, for these are dangerous to cattle.—D. B.

FIBRE CROPS

SPEED, A. **Good quality fibres grow in South Africa.** *Fmr's Wkly, Bloemfontein* **73.** 52–53. 1947. **316**

The possibilities of flax (*Linum usitatissimum*) and sisal (*Agave sisalana ?*) crops for fibrous manufactured products are discussed. Spacing and cultivation techniques are given for the different plants grown in South Africa, among which New Zealand flax and Mauritian hemp occupy extensive areas. The chief plant for yielding soft fibre is flax, and average samples of the South African varieties compare favourably with the Belgian product. Among the indigenous plants capable of fibre production is *Sparmannia africana*, which at present only grows in forests. Farmers regard *Hibiscus cannabinus* as a weed, but this strong and drought-resistant plant also yields a useful fibre amounting to 2 tons per acre, and suggestions are made for its seeding and cultivation.—M. E. E.

JASNY, N. **Unirrigated cotton in southern Russia and the Danubian countries.** *Foreign Agric.* **11.** 2–14. 1947. **317**

The subject is discussed in regard to (1) the history of attempts to grow cotton in these regions, (2) present areas of production, (3) soil, moisture, and temperature requirements of cotton, (4) suitable varieties, yields, and growing technique, and (5) economic aspects.—M. H.

PARNELL, F. R., HUTCHINSON, J. B., ANSON, R. R., & PEAT, J. E. **Possibilities of increased cotton production in East Africa.** *Emp. Cott. Gr. Rev.* **24.** 157–174. 1947. **318**

Higher yields and greater acreages are necessary to bring about the required degree of expansion of cotton growing in the African Colonies. Better methods in farming practice are required but it is difficult to persuade the cultivator to alter his traditional methods. Planting a bigger acreage is the most direct method of increasing production but the problem of finding the settlers for newly-occupied areas would prove a real stumbling block. The possibilities of a cotton scheme akin to the groundnut scheme are discussed.

The planning of a rapid increase in the East African cotton crop on the basis of the knowledge obtained in the Sudan Gezira is suggested as the immediate line of attack. The triple partnership between the Sudan Government, the Sudan Plantations Syndicate, and the peasant cultivator raised the Gezira from a barren waste to a leading position among African cotton producers in a few years. The Lower Shire River Valley in Nyasaland and Sukumaland in the Lake Province of Tanganyika are the two areas to which a similar triple partnership might be applied.

During the war years the Government was obliged to put a restriction on cotton growing in the Anglo-Egyptian Sudan but now the position has reversed, cotton prices having risen from 34 piastres to 72 piastres per 100 lb of seed cotton. Peasants are clamouring for seed but unfortunately the present supply is sufficient to sow little more than 12,000 acres. Average yields need to be improved, otherwise it will require three seasons to accumulate sufficient seed to meet their full requirements, which in 1934 were estimated at 104,000 acres.

If an increase in the production of cotton from Tanganyika were required urgently enough a big increase could be possible : if it were worth while the crop might be doubled or even trebled but European supervisory staff would be essential.—G. M. H.

ROBINSON, B. B. **Minor fiber industries.** *Econ. Bot.* **1.** 47–56. 1947. [Div. Cotton and Other Fiber Crops and Diseases, U.S.D.A., Beltsville Md.] **319**

An account is given of the cultivation, harvesting, and industrial utilization of *Tillandsia usneoides* for fibre, *Sabal palmetto* for bristles, *Serenoa repens* for upholstery filling, *Spartina spartinae* for brooms, and *Dipsacus fullonum*, the burs of which are used for raising the nap of woollen cloth.—D. B.

VACHHANI, M. V. **Some indigenous fibre plants of Sind.** *Indian Fmg* **7.** 383–384. 1946. [Agric. Res. Sta., Dokri] **320**

With the exception of cotton, the fibre plants of Sind have not been publicized, although they provide raw material for many cottage industries. Sar grass (*Saccharum arundinaceum*) is a troublesome weed, but the leaf-sheath yields a valuable fibre which is used for manufacturing chairs, baskets, and screens. It is harvested in July-August, and, after drying, the resulting product is strong, elastic, and unusually moisture-resistant. Recent experiments show that the best sowing time is from early July to mid-August ; the most suitable method of propagation is by transplanting seedlings, and the first three to four irrigations are required every four days with the interval lengthening as growth progresses.

Another weed, *Calotropis precera*, produces a strong bark fibre and a useful floss from the seeds, but the separation of the fibre is a tedious process. Pis (*Salix* sp.) and pun (*Typha elephanta*) also provide basket fibres, while *Phoenix dectylifera* yields fibre as a by-product.—M. E. E.

HEBBS, L. G. S., & HILL, E. L. **The paper-making properties of yawa fibre.** *Bull. Imp. Inst., Lond.* **44.** 87–99. 1946. **321**

Yawa fibre is derived from the flowering stem of *Vigna sinensis* var. *textilis*, a variety of the common cowpea. The plant is cultivated in Nigeria where the fibre is used by the natives for making ropes, twines and fishing nets. The article describes a wartime trial of the fibre for paper-making. It was concluded that paper approaching Manila standards can be prepared from the yawa fibre. Mill-scale trials have shown that with minor adjustments in cooking, bleaching, and beating it can replace Manila for many grades of paper.—G. M. H.

MARSH, T. D. **Manila hemp** (*Musa textilis*). *Malay Agric. J.* **30.** 123–129. 1947. [Senior Agriculturist, Malayan Union] **322**

Details are given of three varieties of Manila hemp or Abaca fibre, introduced from the Philippine Islands and now established in Malaya, which produce a fibre which is superior in quality to the local type. They are var. *Tangongon*, var. *Bagulanon*, var. *Baguisanon*. The hemp has been cultivated in Malaya only under experimental conditions by the Department of Agriculture and by a few European-managed estates. In general the Malayan climate is suitable, but plantations should not be subject to high winds which tear the leaves to ribbons. Reports on three samples of fibre, each of 10 lb. weight, show that they compared favourably with the commercial Manila hemp grades.—G. M. H.

VOLIN, L. **Soviet cotton-production plans.** *Foreign Agric.* **10.** 151–152. 1946. **323**

A special programme to increase cotton production in Uzbekistan has been formulated by the Soviet Government. Production declined during the war years, due primarily to a lack of fertilizers. This deficiency was enhanced by the abnormally small use of manure, in spite of the large acreage planted to *Medicago sativa*, which should have provided a good supply of forage for live stock and, consequently, of manure. Little manure was obtained, however, because of a shortage of grain straw for bedding resulting from the displacement of grain by cotton in this region. During the war, grain was introduced into the typical cotton-alfalfa rotation, and this remedied the situation to some extent.

Plans for increasing the cotton area apply only to the Uzbek Republic, where irrigation is practised. In the non-irrigated cotton area of Southern Ukraine, Crimea, and south-eastern European Russia there is to be a decrease in acreage because the product (with short fibre) from these non-irrigated areas is not entirely satisfactory for the Russian textile industry. The cotton was chiefly No. 1306, developed originally from the American King type, and useful because of its early maturity in these northern regions with a short growing season. —M. H.

AFZAL, M. **Research on cotton in the Punjab. I.—*Desi* cottons.** *Indian Fmg* **7.** 276–280. 1946.

Research on cotton in the Punjab. II.—American cotton. *Indian Fmg* **7.** 341–345. 1946. [Cotton Res. Lab., Lyallpur] **324**

As differences of soil and climatic conditions necessitate more than one variety of *Gossypium* sp. to suit the entire cotton belt of the Punjab, sub-stations have been established within the five ecological zones for breeding suitable varieties. In most of these zones a number of *arboreum* cottons are grown, and in the south-eastern region only *desi* cotton is grown, but a new American variety has recently been introduced which seems to suit large areas of the tract. Many improvements in yield and ginning percentage have been made, and comparisons of improved strains are presented. Experiments to increase staple length were begun in 1930, and a large number of strains, collectively called Jubilee, have been isolated. The staple of Jubilee cotton is being improved still further by crossing it with the wild Nigerian *G. anomalum*. Crosses already produced have fibre lengths ranging from 0·83 to 0·88 in., and yield more than 17 maunds per acre.

In the second article, the history of American cotton introductions into India is traced, and their adaptation in the Punjab is described. A comparatively new strain, 289F/43, is a very drought-resistant early-maturing variety. It is resistant to attack from jassids, and the lint is long and fine. Its rather low ginning outturn of only 30 per cent is being increased by reselection. The best of the American commercial varieties is 199F, which yields about 24 maunds per acre and has a ginning outturn of 36·1 per cent. Other economically significant varieties are also described, and it is hoped to produce new Punjab-American progenies in which the staple length will rival that of the East African cottons. M. E. E.

PAVATE, R. S. V. C. **Cultivation of Jayavant cotton in the Bombay Province.** *Indian Fmg* **7.** 392–394. 1946. [Dharwar, Bombay] **325**

Kumpta cotton, which occupied 85 per cent of the total cotton-growing area in southern Bombay, had many defects, including uneven short staple, susceptibility to wilt, and low yield. The new variety Jayavant (Victorious), recently developed from Kumpta, has a uniform staple of 1 in., an even white colour, and high wilt resistance. Sown from August to September, it is harvested in three pickings during March and April, and now forms the main cotton crop of the Province.—M. E. E.

Kugler, W. F. El mejoramiento del lino oleaginoso y textil en la Argentina. [**The breeding of flax for oil and fibre in Argentina.**] *Rev. Fac. Agron., Montevideo* **44.** 29–67. 1947. [Director, Est. Exp. Pergamino, Argentina] **326**

Until recently, *Linum usitatissimum* was grown in Argentina practically entirely for its seed, which, after maize and wheat, constitutes the country's most important cash crop. The average area occupied is 2,500,000 ha. Occasional efforts to process the waste straw for fibre were not successful until recently, and then on a small scale only. Growing flax for fibre dates from 1936, but the seed for this purpose, which had to be imported from Europe, proved unsuitable under the conditions of the Argentine flax region (northern part of the province of Buenos Aires and the south of that of Santa Fé). Flax breeding was begun at Pergamino in 1927, and was extended in 1937 to include flax for fibre. In 1945, the Station had under observation a collection of 519 foreign varieties, mostly for fibre, and 291 Argentine varieties. Objectives comprise resistance to (*a*) the wilt which is due to flax-sick soil, (*b*) flax rust (*Melampsora lini*), and (*c*) the disease caused by *Sphaerella linorum*; adaptation to the climatic conditions of the region; yield and industrial quality of (i) seed, (ii) fibre. The author's account of the work and the tables presented show that a considerable amount of progress has been made towards achieving these aims.—G. M. R.

ТЕР-АВАНЕСЯН, Д. К методике определения скороспелости у хлопчатника. *Доклады Всесоюз. Акад. С.-Х. Наук* 1945. № 11-12, стр. 21-4.

Ter-Avanesjan, D. [**Determination of earliness in cotton varieties.**] *Doklady Vsesojuz. Akad. S.-H. Nauk* 1945. No. 11/12. pp. 21–24. [All-Union Inst. Plant Prod.] **327**

Ripening is a factor which affects the distribution of the most valuable varieties of American and Egyptian cotton in the more northern areas of cotton production. It is well known that early ripening varieties distributed at present in new regions (southern Ukraine, northern Caucasus) are not equal, in technological qualities, to the better American forms which occupy a large area in Uzbekistan.

The method of determining earliness usually adopted is based on observing the number of days which elapse from the date of sowing to the ripening of 50 per cent of the bolls. A comparison of data regarding different varieties (from the same or various sources) shows that results obtained from these observations may be conflicting. For example, the varieties Chaco and Hlopok, both from the Argentine, each give 50 per cent ripening in 144 days, and each has an average number of 25 bolls on one bush, but the percentage harvested up to the onset of autumn frosts is 96·2 in the case of Chaco and only 69·2 in the case of Hlopok. Earliness in ripening should therefore be estimated, in addition, on a basis of percentage or absolute yield up to the time of the onset of frost in a given locality. Furthermore, a variety should possess such potential vigour that it utilizes fully the vegetative period from the sowing date to the average date when the onset frost occurs in a specific area. Consequently there is need to consider the second variant, when determining earliness in ripening, with regard to the amount of accumulated cotton yield obtained at the average calendar date for the onset of autumn frost in a given region.—M. H.

Edinburgh and East of Scotland College of Agriculture, Economics Department. **Economics of the 1942 flax crop in the east of Scotland.** By *D. Witney, J. D. Nutt, D. M. R. Leask, H. Christine McIver*, and *C. G. Hoyte.* 1945. pp. 11. (Mimeographed.] **328**

Flax can be grown at a good profit per acre up to 500 feet above sea level; above that level profits fall off rapidly.

The best returns were obtained from flax grown on medium loams and where the crop was grown on old arable land. Flax grown on old grass ploughed out yielded a useful return which, although it did not compare with the return from flax grown on arable land, may have been better than the return which would have been obtained from, say, oats on ploughed-out grass.

The results of the 1942 investigation indicate the possibility of profitably incorporating flax-growing into the economy of the farm, particularly on moderately rented farms on medium to light loamy soil, always provided that the main difficulty in the provision of adequate harvest facilities can be overcome. It is unlikely, however, that flax will become more than a "special" crop replacing a relatively small part of one of the principal rotation crops. Otherwise there would be some danger of adverse secondary effects, e.g. a substantial reduction in the fodder acreage might have repercussions on the live stock policy of the farm, or it may be considered that flax is still too much in the experimental stage to replace sale crops on any extensive scale.—Authors' summary.

Edinburgh and East of Scotland College of Agriculture, Economics Department. **Economics of the 1943 flax crop in the east of Scotland.** By *D. Witney, J. D. Nutt, D. M. R. Leask, H. Christine McIver,* and *C. G. Hoyte.* 1945. pp. 11. [Mimeographed.] **329**

Records of growing 895 acres of flax show that in some respects conditions were more favourable than in 1942. The 1943 crop was, however, graded as being lower in quality, and the average yield was reduced by 6 per cent. Although the 1943 results were disappointing, they show that, under suitable conditions and good management, the crop is capable of a profit of £10 or more per acre.—P. M.

Edinburgh and East of Scotland College of Agriculture, Economics Department. **Economics of the 1944 flax crop in the east of Scotland.** By *D. Witney, J. D. Nutt, D. M. R. Leask, H. Christine McIver,* and *C. G. Hoyte.* 1946. pp. 11. [Mimeographed.] **330**

Flax growing in 1944 appeared to have been given more serious consideration on the part of the growers, as evidenced by the higher scale of costs even after allowing for increases in labour rates, by the better use of artificial manures and by the increased growing of the crop under good conditions of soil, elevation, and place in rotation.—Authors' summary.

СТРОГОНОВ, Б. П. К вопросу о прорастании семян хлопчатника с засоленных почв. *Доклады Акад. Наук СССР.* Том 54. № 7, стр. 649-51. 1946.
Strogonov, B. P. **A contribution to the study of germination of cotton seeds collected from saline soil.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **54.** 645–647. 1946. [Timirjazev Inst. Pl. Physiol., Acad. Sci. U.S.S.R.] **331**

Seeds of *Gossypium hirsutum* var. 8517 were grown under conditions of saline soil at the Fedčenko Experiment Field, Fergana valley. There is indication that such seeds contain some specific substances inhibiting germination and growth at their initial phases. These substances can be washed out by soaking the seeds in running water.—M. H.

Cass Smith, W. P., & Harvey, H. L. **Flax seed treatment.** *J. Dep. Agric. W. Aust.* **23.** 207–212. 1946. **332**

Recent experiments with *Linum usitatissimum* confirmed the value of fungicidal seed treatment for reducing damping-off losses and producing better stands. The two most effective treatments were 2 oz. per bushel of either Ceresan UT 1875 A or Tetroc (spergon) which gave 51 and 50 plants respectively per foot of row in comparison with 32 plants obtained from untreated seed.—M. E. E.

Cashmore, A. B., Moore, R. M., & Lee, A. A. **The control of capeweed** (*Cryptostemma calendulaceum* (**L.**) *R. Br.*) **in flax.** *J. Coun. Sci. Industr. Res. Aust.* **19.** 269–272. 1946. [Divn. Plant Industry, C.S.I.R. (A.B.C. and R.M.M.) and Flax Production Cttee. Dept. Supply and Shipping (A.A.L.)] **333**

A commercial weedicide, Dinoc (30 per cent sodium dinitro-o-cresylate), effectively controlled a heavy infestation of capeweed (*Cryptostemma calendulaceum*) in a flax crop, and resulted in the production of an economic crop. Unsprayed flax lodged badly as a result of the heavy growth of capeweed, and could not be harvested effectively. The addition of an "activator" (sulphate of ammonia) to the Dinoc spray injured the flax and reduced its yield.—Authors' summary.

Louisiana Agricultural Experiment Station. Bull. 406. **A study of the effect of fertilizers on various characters of the cotton plant.** By *H. B. Brown.* 1946. pp. 48. **334**

The chief character studied was the fibre quality of *Gossypium* sp. of which a wilt-resistant, long-staple variety was planted on 32 plots, the seed having first been treated with Ceresan to control seedling diseases. Better fertilizers, such as a mixture of potash, phosphorus, and nitrogen had marked and consistent effects on the growth of plants; the most blooms and least ball shedding were produced by treatment with 20 tons of farmyard manure mixed with phosphorus and potash. Good fertilizers also gave a higher lint index, longer staple, and higher seed index. The early bolls from well-fertilized plants produced cotton fibre of great strength and resilience.—M. E. E.

Florida Agricultural Experiment Station. Bull. 412. **Culture, fertilizer requirements, and fibre yields of ramie in the Florida everglades.** By *J. R. Neller.* 1945. pp. 412.
335

In fertilizer experiments made between 1938 and 1942, the approximated yield was 2140 lb. per acre per year, but of this 80 per cent should be anticipated the fresh green weight was between 31 and 47 tons, one-half of which was leaves, high in protein and offering possibilities as a by-product food. The growing of ramie would fit well into a diversified crop programme for the Everglades region.—P. M.

SINDOS, COTTON RESEARCH INSTITUTE. Sci. Bull. No. 1. **Cotton seed treatment for controlling seedling diseases.** By *B. G. Christidis.* 1947. pp. 32. [English translation, pp. 23–32.] [Cotton Research Trust, Sindos, Greece] **336**

Literature reveals that treating the seed with organic mercury dusts has proved very effective in controlling fungus organisms. Dust treatment seems preferable to disinfection by sulphuric acid. The treatment is more effective under conditions favouring the development of damping-off organisms. Disinfection seems essential with early sowing, whereas with late sowing its effect may be negligible.—G. M. H.

AFZAL, M., & GHANI, M. A. **Cotton jassid in the Punjab.** *Indian Fmg* **7.** 407–410. 1946. [Cotton Research Lab., Lyallpur] **337**

Severe reductions in yield of American cotton grown in the Punjab have been caused by jassids, among which *Empoasca devastans* is the most common. An exhaustive survey of the alternative host plants has been made, and the effects of agronomic and other factors on jassid population were studied. Chemical and biological methods of control have been unsuccessful, and the only present alternative is to breed and grow resistant cotton varieties.—M. E. E.

COMMON, I. F. B. **Control of the cotton web-spinner.** *Qd. Agric. J.* **64.** 78–81. 1947. **338**

Crops including *Gossypium* sp., *Arachis hypogaea*, *Medicago sativa*, and *Sorghum* spp. were damaged during the spring of 1946 by *Loxostege affinitalis* in central and southern Queensland. The moths choose a large number of weed hosts on which to lay their eggs, but lucerne is the only cultivated crop so used. From these plants the pest is likely to invade cotton and other nearby crops when once the host plants have been severely damaged. When an outbreak occurs in the spring, it is more serious, because the young plants are very susceptible to attack. The most effective control measure is to maintain weed-free crops away from weedy headlands. When once infested, weeds in crops can be sprayed or dusted with DDT or lead arsenate to destroy the insects, and a cutworm bran bait may be used where paths have already been made into the crop by larvae. On cotton, effective control may be obtained by applying insecticides containing arsenic, whereas on fodder crops this method is unsuitable.—M. E. E.

GAINES, J. C., OWEN, W. L., Jr., & WIPPRECHT, R. **Effect of dusting schedules on the yield of cotton.** *J. Econ. Ent.* **40.** 113–115. 1947. [Texas Agric. Expt. Sta., College Station] **339**

Early and late dusting schedules for *Gossypium* sp. were compared. DDT-sulphur dusts at 5 per cent concentration were employed to control the ravages of weevils and bollworms late in the season, and the thrips population was considerably reduced by early dusting. It was unprofitable to dust cotton plants throughout the season, since no appreciable increase in yield was effected, but results showed that dusting from late July to August was beneficial for fruit protection.—M. E. E.

SCHUSTER, M. L., & ANDERSON, E. J. **Seedling blight and root rot of flax in Washington.** *Phytopathology* **37.** 466–473. 1947. [Washington State College, Pullman] **340**

FLOR, H. H. **Inheritance of reaction to rust in flax.** *J. agric. Res.*. **74.** 241–262. 1947. [Div. Cereal Crops and Diseases, U.S.D.A.] **341**

VANTERPOOL, T. C. **A seedling blight and leaf spot of flax caused by** *Coniothyrium olivaceum* **Bon.** *Canad. J. Res.* **25.** Sect. C. 54–59. 1947. [Univ. Saskatchewan, Saskatoon, Canada] **342**

PINHEY, E. C. G. **The Sunn hemp beetles.** *Rhod. Agric. J.* **44.** 74–81. 1947. **343**

Sunn hemp, grown in Southern Rhodesia chiefly as a weed-suppressing green manure crop, and to a lesser extent, for hay, compost, as a cover crop in orchards, and for seed, has suffered annually in recent years from depredations of the sunn hemp beetles. A consideration of the nature of the damage, the uses of sunn hemp and the possibilities of substitute crops is followed by an account of the habits of sunn hemp beetles. The beetles emerge from previously infested lands soon after heavy falls of early rains commencing in November. If no sunn hemp is nearby they may rest on any available plants, such as sweet potato, maize, and other crops, or on weeds, sticks, or fencing. But immediately they have emerged from the soil they have sufficient internal food reserve to last two or three weeks without feeding. Sunn hemp (*Crotalaria juncea* L.) is the only general crop these beetles will readily attack.

The methods suggested in the control of this

6 or 7 mm. long and 2 or 3 mm. broad, dark brown or black, elliptically-shaped beetle are (1) for growers in those areas known to be infected to avoid the use of sunn hemp for the same two or three years by utilizing a substitute crop during the period, (2) late planting of the sunn hemp crop, (3) the planting of an early trap crop around lands with infested crops in the previous season to occupy the attention of emerging beetles, or (4) ploughing in the crop in March or April, and re-ploughing or disc-harrowing in the following October.—G. M. H.

Millikan, C. R. **Zinc deficiency in flax.** *J. Dep. Agric. Vict.* **44.** 69–73 and 88. 1946. **344**

Zinc deficiency seen in flax crops in certain districts of Victoria has been controlled in the field by applications of zinc sulphate. Affected plants show die-back, bronzing, or rosetting. Plants recover from the disorder in spring, and make prolific and healthy second growth. In water-culture experiments, however, no such recovery occurred. Time of sowing had a significant effect on the incidence of the trouble. The development of the disease was greatest in the June sowing, after which progressive and significant reductions in the percentages of both die-back and total zinc deficiency occurred in the July and August sowings respectively. The severity of symptoms was least in the August sowing. Superphosphate dressings by themselves had no effect on the incidence of zinc deficiency, but when applied in conjunction with 30 lb. of zinc sulphate per acre, the superphosphate 10 cwt. per acre treatment induced a significant increase in the percentages of both die-back and total zinc symptoms.—Courtesy of Imperial Bureau of Horticulture and Plantation Crops.

ЧАЙЛАХЯН, М. Х. О ложном иммунитете растений. *Доклады Акад. Наук СССР.* Том 56. № 1, стр. 99-101. 1947.

Čaĭlahjan, M. H. **Pseudo-immunity in plants.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **56.** 99–101. 1947. [Timirjazev Inst. Pl. Physiol., Moscow] **345**

Study has been made of development in *Orobanche* spp. in connexion with growth and development of host plants belonging to various species. The author now considers one species of *Orobanche* (*O. ramosa*) developing on roots of three different varieties of *Cannabis sativa*, namely (1) the late-maturing Italian, (2) medium-early Novgorod-Seversk, and (3) early-maturing Karpogorsk. The relation between infection by broomrape and growth of the host under long or short day is the same as observed in an earlier work, that is, vegetative growth lasts longer under long day and this stimulates broomrape development.

Plant immunity thus depends on "escape from infection" due to effect of growth conditions on maturation. This phenomenon the author terms pseudo-immunity of plants.—M. H.

Millikan, C. R. **Frost injury to flax.** *J. Dep. Agric. Vict.* **44.** 381–384. 1946. **346**

Frost damage to flax in Victoria during the winter and early spring months is not unusual. Symptoms have been observed in plants at all stages of growth. Seedlings severely injured become dark olive-green and water-soaked immediately after frosting, the colour soon changing to a light brown as the dead tissues dry out and shrivel. The flax plant is most sensitive to frost in the two-leaf or cotyledonary stage. From this stage until it is at least 4 to 5 in. tall, it rapidly becomes very resistant, even to very severe cold, but with increasing age it again shows some sensitivity, particularly to severe frost. This sensitivity to frost is increased by waterlogging.—Courtesy of Imperial Bureau of Horticulture and Plantation Crops.

СТРОГОНОВ, Б. П. О приспособлении хлопчатника к почвенному засолению. *Доклады Акад. Наук СССР.* Том 54. № 5, стр. 457-60. 1946.

Strogonov, B. P. **On the adaptation of the cotton plant to high soil salinity.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **54.** 453–456. 1946. [Timirjazev Inst. Pl. Physiol. Acad. Sci. U.S.S.R.] **347**

Leaves of the cotton plant become adapted to conditions of increased salinity, but in the reproductive organs (seeds) the adaptation is not perceptible by any increased resistance. It is assumed that the duration of the growth period is sufficient to permit adaptation in vegetative organs which possess a greater degree of plasticity than do reproductive organs, and are subjected to a more prolonged influence of salts during ontogensis.—M. H.

СТРОГОНОВ, Б. П. и ОСТАПЕНКО, Л. А. Об аммиачном отравлении хлопчатника в условиях засоления. *Доклады Акад. Наук СССР.* Том 54. № 4, стр. 369-71. 1946.

Strogonov, B. P., & Ostapenko, L. A. **On the intoxication of cotton plants with ammonia when grown under conditions of increased soil salinity.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **54.** 365–367. 1946. [Timirjazev Inst. Pl. Physiol., Acad. Sci. *U.S.S.R.*] **348**

The experiments were carried on at the Fedčenko Experiment Field in the Fergana

Valley with American cotton, variety 8517. As salt concentration in the soil increases, considerable quantities of ammonia are accumulated in the leaves. The salts penetrate into the tissues and affect the direction of the process of N exchange, causing breakdown of the protein substances and the formation of volatile compounds of the type of ammonia.—M. H.

СТРОГОНОВ, Б. П. и ОСТАПЕНКО, Л. А. Об углеводном обмене хлопчатника в условиях засоления. *Доклады Акад. Наук СССР.* Том 54. № 3, стр. 273-6. 1946.
STROGONOV, B. P., & OSTAPENKO, L. A. **On the carbohydrate exchange in cotton under conditions of increased soil salinity.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **54.** 273–276. 1946. [Timirjazev Inst. Pl. Physiol., Acad. Sci. U.S.S.R.] **349**

The experiments were conducted in 1939 and 1942 at the Fedčenko Experimental Field in the Fergana Valley with the American cotton varieties 8517 and C460, which are grown on a commercial scale in soils with predominant sulphate salinization. There is evidence that under salinization the leaves assume the role of a storage organ in addition to their assimilatory functions. Inhibition in the growth of plants raised on soils with an increased salt content is evidently caused by agents which prevent the plants from utilizing the nitrogen and carbohydrates available for the formation of new tissues, rather than by the content of either of these substances.—M. H.

СТРОГОНОВ, Б. П. Связывание минеральных ионов в растении при засолении почвы. *Доклады Акад. Наук СССР.* Том 54. № 9, стр. 841-3. 1946.
STROGONOV, B. P. **Binding of mineral ions in plants grown under conditions of increased soil salinity.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **54.** 833–835. 1946. [Timirjazev Inst. Pl. Physiol., Acad. Sci. U.S.S.R.] **350**

The accumulation of sugar and albumen has been interpreted by the author as a protective reaction developed by the plant in the course of adaptation to unfavourable conditions of high soil salinity. It has been assumed that probably the protective role of the albumens consists in neutralizing the toxic effect of salts supplied to the plant tissues. The experiments described indicate that chlorine supplied to leaves of cotton plants grown on saline soils is contained in the leaves in two forms, a free form readily washed out by water and a bound form which defies washing out for a short period. The amount of bound chlorine differs according to plant variety and to environmental conditions. It is postulated that binding of chlorine by albumen is one of the possible reactions of binding mineral ions by various organic substances in the plant cell owing to which the salts which penetrate to the cell are prevented from affecting the plasm.—M. H.

EATON, F. M., LYLE, E. W., & ERGLE, D. R. **Relations between carbohydrate accumulation and resistance of cotton plants to *Phymatotrichum* root rot in dry summers.** *Plant Physiol.* **22.** 181–192. 1947. [Texas Agric. Exp. Sta., College Station] **351**

It is a general observation that this root rot of cotton is less severe in dry than in wet summers. Experiments showed that this was not due to inability of the fungus to spread under dry conditions, but rather to the increased resistance of the cotton plant. Comparing plants grown in dry plots and in irrigated plots, the root bark of the former contained higher concentrations of carbohydrates than the latter, and they were more resistant than the irrigated plants.—D. B.

HANCOCK, N. I. **Variations in length, strength, and fineness of cotton fibres from bolls of known flowering dates, locks, and nodes.** *J. Amer. Soc. Agron.* **39.** 123–134. 1947. [Tennessee Agric. Exp. Sta., Knoxville] **352**

Variations in length, strength, and fineness of fibre are due largely to the long fruiting period of the cotton plant which extends over a period of 6 to 10 weeks. Environment has therefore ample opportunity to affect the cotton inside the bolls. The complex structure, consisting of fruiting limbs, fruiting nodes on each limb, and bolls from the fruiting nodes, may be a response to development and growth through varying seasonal conditions.

Sampling procedures are suggested on the basis of measurement of length, strength, and fineness of fibres from about 2000 bolls. "Three pickings representing three maturity dates are justified for accurate sampling by an agronomist and at least four bolls harvested from the middle of the plant by the breeder."—D. B.

TEXAS AGRICULTURAL EXPERIMENT STATION. Bull. 677. **Fruiting and shedding of cotton in relation to light and other limiting factors.** By *A. A. Dunlop.* 1945. pp. 104. **353**

Several varieties of cotton grown in cultures of soil and of sand were used in the experiments with variations in light, soil moisture, and temperature. Periods of low light intensity or short-day periods of full sunlight impaired the fruiting capacity of the plant and increased vegetative growth, and these effects were more marked in some varieties than in others. Increases of yield due to the addition of soil nitrogen were not forthcoming when frequent wilting or a continuously low moisture content was also applied. High shedding rates and decreases in weight of bolls per plant were associated with high temperatures, but the effects of light on fruiting and shedding were greater than those produced by any other factor.—M. E. E.

МИКАЙЛОВ, М. А. Перекресное опыление хлопчатника. *Извест. Акад. Наук Азербайджан. ССР.* 1945. *№* 2, стр. 51-6.
Mikaïlov, M. A. [**Cross pollination in cotton.**] *Izvest. Akad. Nauk Azerbaĭdzan S.S.R.* 1945. pp. 51–56. **354**

Pollen grain adhesion to the glycerin smear surface of small glass screens is taken as evidence of dispersal of pollen by wind, and consequently of possibilities for cross-pollination between neighbouring plantations. The rate and the distance of pollen dispersal depends, however, not only on the velocity and direction of winds and on topography, but also on the morphology of the varieties. Thus, no pollen dispersal was recorded from the 486/2 variety; again, the pollen of variety 01 was carried much farther than that of variety 02.—M. A. O.

Rothmaler, W. Sôbre a sistemática e a sociologia dos linhos de Portugal. [**The systematics and sociology of flax in Portugal.**] *Agron. Lusitana* **6.** 253–279. [German summary, 277–278.] 1944. [Received 1947.] [Est. Agron. Nac., Sacavem, Portugal, and Berlin-Dahlem, Germany] **355**

The cultivated flaxes comprise three species, namely, *Linum hispanicum*, the wild flax, of which two forms exist in the Iberian peninsula, *L. humile* with ssp. *crepitans* and ssp. *transiens*, and *L. usitatissimum* with ssp. *vulgare* and ssp. *bienne*. The following species are adulterations peculiar to flax fields: *Lolium brasilianum*, *Camelina alyssum*, *Cuscuta epilinum*, *Spergula maxima*, *S. camarae*, and *Silene linophila*. The two last-named are new species, and both, like *Lolium brasilianum*, originate in the Portuguese or Spanish flax cultures. *Lolium brasilianum*, which closely resembles *L. multiflorum*, is, perhaps, the most characteristic and frequent adulterant; it has been introduced with Iberian flaxes into Argentina, whence, after cleaning from flax seed, it is even occasionally exported as "Argentine ryegrass." Other secondary adulterants are listed. The origin of flax cultivation, in spite of the diversity of forms of *L. humile* found in Portugal, must be sought in the eastern Mediterranean region. Attention is drawn to the value of several of the Portuguese wild forms for breeding, and the sociology of the *Linum* associations is discussed. —G. M. R.

SUGAR BEET

Åstrand, H. Sockerbetsodlingen 1946. [**Sugar beet cultivation in 1946.**] *Lantm. Svenskt Land* **31.** 132. 1947. **356**

In Sweden, the contracted area was 53,422 ha. and the measured-up area, which is always slightly larger, was 54,788 ha. Öland and Gotland showed the largest increases. Sowing took place in Scania during the last few days of April, slightly later than usual, but was early on Götland. On about 100 farms, small areas were sown with mono-germ seed. On the average of 60 trials this resulted in a saving of 30 per cent in time spent in singling, but there was a certain reduction in yield. Although there was a scarcity of labour, only one small area had to be ploughed up on account of inability to procure workers. There were no very severe ravages by insects. Altogether 22 ha. were destroyed by the gamma fly (*Phytometra* (*Plusia*) *gamma*), with the most serious injuries in east Scania.

In many places the plant stand was poor. The yield in Halland was the lowest in the country, 255 deciton beets per ha. The largest crop was obtained as usual in the Hököpinge district, 383 deciton beets or 6740 kg. sugar per ha. Götland had its best crop since 1937, 321 deciton beets and 18·45 per cent sugar content. The mean beet yield was 325 deciton beets per ha., and the sugar content 17·50 per cent. The total crop of beets amounted to 1,777,000 tons, and the yield of raw sugar was estimated to be 289,000 tons. With continued rationing, this amount is sufficient to meet the country's sugar requirement for another year. —R. P. J.

МИРОШНИЧЕНКО, Р. А. Развитие свёклосахарной промышленности в прибалтийских советских республиках. *Сахар. Промышл.* 1947. *№* 7, стр. 8-10.
Mirošničenko, R. A. [**Development of the sugar-beet industry in the Baltic Soviet Republics.**] *Sahar. Promyšl.* 1947. No. 7. 8–10. 1947. **357**

The wide-scale development of sugar-beet sowings in these States began only in recent years; in Latvia from 1925, in Lithuania from 1930, and in Esthonia during 1946. The areas sown to sugar beet in Lithuania in 1939 comprised 7·9 thousand ha., and in Latvia 12·8 thousand ha. These sowings have now been greatly extended. There is discussion of various factors (economic, climatic, and geographical) which influence development of the sugar-beet industry.—M. H.

Noeldechen. Standweite und Sortentyp. [**Planting distance and varietal type.**] *Kühn-Archiv* **60.** 178–188. 1943–44. [Delitzsch] **358**

The subject is discussed in relation to sugar beet. Five years' experiments (1938–42) were conducted with six different varieties. Increasing the planting distance led every year to considerable increases in yield of weight and sugar per beet, and ash content was also increased. Percentage of sugar and content of dry matter, together with purity quotient, had a tendency to fall with increasing planting distance. Years with absolutely high yields of weight and sugar did not always lead also to relatively higher increase. The relative diminution in sugar percentage also is not in any close relation to the absolute height of the sugar percentage, although years favourable for sugar formation in general exhibit the lowest relative diminution in sugar percentage. The yields of weight and sugar in every year are highest with the narrowest of the planting distances chosen (100,000 beets per ha.). When the number of beets is reduced to 66,600 to 50,000 per ha., the larger number of beets gives, in accordance with the weather, sometimes higher and sometimes lower yields of beet per ha. The sugar yields per ha. here also fall constantly with a diminishing number of plants. The average reduction of yield per ha. amounted, with the medium planting distance, to approximately 10 per cent ; in the case of the lowest number of beets tested, there was no further diminution in yield in comparison with the medium number of beets. Yields of sugar fell on an average by 13·5 per cent or 16·7 per cent. The variations in the different years are considerable. The behaviour of the varieties tested is compared.—G.M.R.

ФОКЕЕВ, П. М. Приёмы весенней агротехники сахарной свёклы. *Бюлл. Инст. Зерн. Хоз. Ю-В. СССР.* 1943. № 4, стр. 3-8.

Fokeev, P. M. [**Some measures for the management of sugar beet in spring.**] *Bjull. Inst. Zern. Hoz. Ju.-V. S.S.S.R.* 1943. No. 4. 3–8. **359**

The purpose of the five experiments described was to find the best means of giving the sugar beet crop a good start. The experiments show the effectiveness of stimulating germination by means of vernalization and by another method referred to ; sowing at a depth of 4 cm. rather than 2 cm. or 6 cm., and rolling down the seeds sown ; sowing at a rate of 10 kg. of seed per ha. in wet seasons, but at higher rates in dry seasons ; manuring along the rows, the value of $N_{10}P_{20}$ and poultry manure being especially marked ; and leaving a distance of 15 cm. between the plants in a row, rather than 20 or 25 cm.—I. Z.

Rayns, F. **Sugar beet singling.** *Brit. Sugar Beet Rev.* **15.** 125–127. 1947. [Norfolk Agric. Sta.] **360**

Records made in Norfolk show that delay in singling until the beets have six leaves reduces yield by about 0·5 ton per acre. Delay of another week adds another 0·75 ton to the loss. There are some advantages to be obtained (shown by experiments in Norfolk) by singling slightly earlier than the four-leaf stage, but when thinning is a problem, bunching or cross-blocking is recommended. The latter process is suitable on a good plant stand.—M. H.

ДАНИЛЕВИЧ, М. М. Режим орошения сахарной свёклы в Заволжье. *Бюлл. Инст. Зерн. Хоз. Ю-В. СССР.* 1943. № 4, стр. 9-11.

Danilevič, M. M. [**Irrigation of sugar beet in the Trans-Volga region.**] *Bjull. Inst. Zern. Hoz. Ju-V. S.S.S.R.* 1943. No. 4. 9–11. **361**

During wet seasons, irrigation at a rate exceeding 500 to 700 cu. m. per ha. and more than four times has little effect on the yield of roots. But in dry seasons it was found well worth while to irrigate as much and as often as was necessary to maintain the moisture content of the soil at 75 to 85 per cent.—I. Z.

ВИТАВСКИЙ, И. М. О сроках посева сахарной свёклы *Совет. Агрон.* 1947. № 3, стр. 92-8

Vitavskiĭ, I. M. [**Sowing date for sugar beet.**] *Sovet. Agron.* 1947. No. 3. pp. 92–98. **362**

Yields of sugar beet (often low in dry years) are determined by an optimal sowing date. The full significance of this factor has not yet been elucidated, but the present paper brings together certain general observations on the problem obtained from various stations in the sugar-beet areas of U.S.S.R.

So-called early sowings are made in the first half of April, medium sowings in the second half of April, and late sowings in the first half of May. Late sowings result in acute lowering of root and sugar yields. The following data were obtained from experiments made by the

All-Union Sugar Beet Sci. Inst. in three zones of beet production :—

	Sowing time.	*Precipitation.* *Good.*	*Average*	*Low.*
Root yield centn. per ha.	Early ..	243	308	285
	Average..	220	289	272
	Late ..	200	284	249
Sugar yields centn. per ha.	Early ..	40·5	55·5	47·0
	Average..	34·5	50·0	45·2
	Late ..	31·4	48·1	42·1

—M. H.

Tolman, B. **Population and distribution studies with sugar beets.** *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting, 1946. 177–184. **363**

Tests reported include 20, 60, 32, and 38 in. row widths, with 8, 10, 12, and 15 in. spacings in the row. Distribution pattern had more effect on yield and sucrose content than did per acre population. A decrease in yield was observed as spacing within the row was increased beyond 12 in. In each case, an increase in the space allotment of the beets showed a decrease in sucrose percentage.—P. M.

Ryser, G. K., & Owen, F. V. **Yields from sugar beets with doubles 20 inches apart versus singles 10 inches apart.** *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting, 1946. 166–168. **364**

It is difficult to thin the single beets when the operation is carried out by mechanical means or by long-handled hoe. Single beets were thinned to 10 in. apart and doubles to 20 in. apart. Data indicates a small and possibly significant increase in yield with single beets spaced 10 in. apart. If the distances are small with practically 100 per cent doubles, it would be smaller if the doubles were less than 100 per cent—as they would be in field practice. Tolerance of doubles would mean less disturbance and injury to seedlings in the thinning operations.—P. M.

Murphy, A. M., & Carsner, E. **A wide- and narrow-row test with sugar beets in Southern Idaho.** *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting, 1946. 168–169. **365**

Rows wider than 22 in. apart may be desirable for some mechanical harvesters, but results show serious losses when 44 in. rows were used. Approximately double the number of beets were planted in the 44 in. rows, but the 22 in. rows yielded 3·55 tons more than the 44 in. rows.—P. M.

Birney, S. W. **The effect of single and double plants on sugar beet yields.** *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting, 1946. 174–177. **366**

Beets were thinned to obtain 100 plants per 100 ft. of row, the percentage of doubles in each row increasing by 0, 20, 40, 60, 80 per cent ; the percentages of singles were similarly varied. On these plots the number of beets was 100 for 100 per cent singles, 120 for 80 per cent singles and 20 per cent doubles, and up to 200 beets for zero singles and 100 per cent doubles. Yield from the rows of singles was 11·66 tons to 12·52 tons (from rows with 100 beets per row) and 9·82 tons to 11·75 tons where the number of beets varied from 100 to 200 per row. Smaller beets were produced from the heavier stands. Results showed that when the number of thinned beets is kept at 100 per 100 ft. row, yield is not decreased by increased percentage of doubles, until the percentage of doubles is 50 to 60 per cent.—P. M.

Culpin, S. **Segmented sugar-beet seed trials.** *Agric. Engng Rec.* **2.** 54–57. 1947. [Norfolk Agric. Station] **367**

Trials to discover the suitability of segmented sugar beet seed for British conditions. Field germination percentage of segmented seed was low, and to produce satisfactory plant populations it was usually necessary to drill from 8 to 11 lb. an acre on 18-in. rows, the higher rate being required for heavier soils and less favourable conditions. Segmented seed is less tolerant of heavy soil, weeds, and poor seed beds than natural seed. The results have shown that, provided these limitations are recognized, segmented seed will produce crops equal to those from natural seed, with a saving in singling labour.—G. M. H.

КОЗЛОВСКИЙ, А. И. Сахарная свёкла округлой формы. *Доклады Всесоюз. Акад. С.-Х. Наук* 1947. № 1, стр. 20-1.

Kozlovskiĭ, A. I. [**Globular sugar beet.**] *Doklady Vsesojuz. Akad. S.-H. Nauk* 1947. No. 1. pp. 20–21. [Siberian Inst. for Scientific Studies in Animal Husbandry] **368**

The importance at the present time of sugar beet as animal fodder is emphasized. As harvesting of the ordinary deep-growing form is difficult and costly, breeding to produce a variety with globular roots was begun in 1941, when specimens labelled "white globular hybrid" were received from the All-Union Institute for Plant Breeding. When sown in selection plots, 46·6 per cent of globular roots were obtained with a dry-matter content of 15·8 per cent. By 1945, the percentage of globular roots had risen to 100 per cent, and the dry matter content to more than 20 per cent (sugar content above 16 per cent).—R. P. J.

McBirney, S. W. **The development of sugar beet planting equipment.** *Agric. Engng., St. Joseph, Mich.* **27.** 547–548 and 550. 1946. **369**

Walz, C. W. **The mechanization of sugar beet harvesting.** *Agric. Engng., St. Joseph, Mich.* **27.** 549. 1946. **370**

Urschel, W. E. **A sugar beet combine.** *Agric. Engng., St. Joseph, Mich.* **27.** 551 and 553. 1946. **371**

Guelle, C. E. **A new sugar beet harvester.** *Agric. Engng., St. Joseph, Mich.* **27.** 552–553. 1946. **372**

Four papers presented at the annual meeting of the American Society of Agricultural Engineers at St. Louis, Mo., June, 1946, as a contribution of the Power and Machinery Division. Illustrations show sugar beet planter disk furrow openers, the John Deere beet harvester at work, a rear view of the Scatt-Urschel sugar beet combine, and the McCormick-Deering sugar beet harvester.—R. O. W.

Agricultural Engineering Record. **Sugar-beet harvesting development, 1946.** *Agric. Engng. Rec.* **2.** 2–7. 1947. **373**

After the experimental work of 1945, it was concluded that both the topper-picker and the sweep-elevator might be further developed. A special chassis was constructed with the idea that more experience would be gained with the rotary elevator for windrowing the beet. The machine constitutes a complete harvester. The article is illustrated with photographs and diagrams.—P. M.

Cousins, E. J. **A new spacing and manure placement drill.** *Brit. Sugar Beet Rev.* **15.** 137–138. 1947. [Bury St. Edmunds Beet Sugar Factory.] **374**

The McCormick-Deering machine has been used to drill 100 acres of sugar beet with segmented graded seed. When drilling four rows with 20 in. between the rows, an attempt was made to place a seed every 2 in., using between 4 and 5 lb. of seed per acre and placing 5 cwt. manure at the side of each row of beet. The machine is manufactured by the International Harvester Co.—M. H.

Culpin, C. **Mechanization of beet drilling and thinning.** *Brit. Sugar Beet Rev.* **15.** 57–60 and 73. 1946. [Norfolk Agric. Sta.] **375**

Field experiments at Sprowston have shown that when beet is singled late, yield is lowered by about 0·5 ton per acre for every week that singling is delayed after the four-leaf stage. Means for increasing the rate of singling include mechanical bunching, improved drilling, and seed treatment to produce brairds that are easier to single. Of these processes the first two have not made much progress in recent years, but seed treatment is much in the news.

Methods to speed up singling must not be allowed to result in reduced plant populations.

There is need for more than 50 per cent mono-germ seeds when precision drilling is applied. While the traditional drills are used, "singleness" is more important than high-germinating capacity, but when precision drills become practicable, graded seed will be essential, and it should preferably have about 75 per cent mono-germ pieces and 75 per cent field germination.

Segmented seed is the result of an attempt developed by Bainer (of the University of California) to produce a seed of good germinating capacity with a high degree of singleness. Natural seed is passed between a steel shear plate and a carborundum grinding wheel. It is considered that decortication is a quicker and more simple process than segmentation.

American workers have suggested a means to obviate the problem of poor field germination by making the seed into pellets (pelleted seed) and incorporating an organo-mercuric dressing in the pelleting material. Uncoated segmented beet seeds dressed with an organo-mercuric compound produce only half as many seedlings as coated seeds. Pelleted seed is, further, ideal for use in a precision drill mechanism. The chief drawback of the process is its high cost.—M. H.

Dijkema, R. L. Ervaringen met de mechanisatie van de suikerbietenteelt in 1947. [**Experience in the mechanization of sugar beet growing in 1947.**] *Maandbl. LandbVoorlDnst.* **4.** 531–533. 1947. [Agric. Adviser, Alkmaar, Netherlands] **376**

The increasing use of tractor-drawn beet lifters makes it desirable to increase the distance between the plant rows. Experiments in 1946 and 1947 have shown that sugar beet may be sown in rows 50 cm. apart without risk to yield, provided the requisite number of plants per hectare (70 to 75 thousand) is planted. Of the Wieringermeer area, ± 40 per cent was planted in 50 cm. rows in 1947, and mechanical lifters gave very good results. The two-row lifter is that most frequently seen, but some three-row and four-row lifters are also in use. Areas actually planted in 50 cm. rows were generally found not to have a sufficient number of plants per hectare, and the possibility and necessity of ensuring this are stressed. No connexion was found between percentage of beet yellows virus and distance between the plant rows. It is recommended to top the beets before the mechanical lifter is used, a measure which facilitates the carrying of good, clean, green fodder.—G. M. R.

ЛИХАЧЕВ, А. М. Новый способ посева сахарной свёклы. *Совет. Агрон.* 1947. № 3, стр. 99-102.

LIHAČEV, A. M. [**A new method of sowing sugar beet.**] *Sovet. Agron.* 1947. No. 3. pp. 99–102. **377**

With the object of reducing the manual labour involved in sugar beet production, in 1943 M. A. Kondak designed an implement by which seed can be uniformly sown. Use of the implement results in significant reduction in working days necessary for the thinning process and a lowering of the seeding rate for either whole or segmented seed.—M. H.

LEEDS UNIVERSITY ECONOMICS SECTION DEPARTMENT OF AGRICULTURE. Farmers' Report No. 62. **Sugar beet costs and returns, 1945.** 1946. pp. 8. [Mimeographed.] **378**

With an average yield (1945) of 11 tons 8 cwt. of 16·2 per cent sugar, total returns per acre were £51 10s. 9d., total costs of production £31 16s. 0d., profit £19 14s. 9d. Comparable figures for 1944 were 8 tons 18 cwt., 15·7 per cent, £37 3s. 4d., £31 6s. 6d., £5 16s. 10d.—R. O. W.

SUTTON BONINGTON MIDLAND AGRICULTURAL COLLEGE ECONOMICS DEPARTMENT. **Cost per acre and per ton of growing sugar beet, 1945 crop. 25 fields—271½ acres.** 1946. pp. 3. [Mimeographed.] **379**

The net cost per ton is £24 15s. 0d., and per acre (allowing a yield of 10 tons 18 cwt. per acre with 16·7 per cent sugar content) is 48s. 6d.—R. O. W.

MANCHESTER UNIVERSITY, FACULTY OF ECONOMIC AND SOCIAL STUDIES, AGRICULTURAL ECONOMICS DEPARTMENT (SHROPSHIRE AND STAFFORDSHIRE AREA). **Sugar beet costs and returns.** 1947. pp. 13. [Mimeographed.] **380**

Costs and returns for 1926–46 are reviewed. Briefly, the pre-war position was that fluctuations in the West Midland beet acreages followed closely fluctuations in the crops profitability. A profitable crop in one year promoted confidence and led to an increase in both acreage and growers in the following year.

There is an indefinite relationship between beet and potatoes. The acreages of these two crops seem to vary independently of one another. Yet it is noticed that a sharp upward movement in beet acreage is usually preceded by a slump in potato prices and a recovery in potato prices is usually followed by a fall in beet acreage.

Other factors other than profitability influenced the progress of beet growing during the war, e.g. the allocation of county acreage targets supplemented in some counties by compulsory cropping orders served on individual farmers. The limiting factors have been the factories' capacity to handle the beet grown and the farmers' capacity to find sufficient man power, motive power and manures to properly tend larger acreages.

Costs and Returns per Acre in 1945 *and* 1946.

	1945.			1946.		
No. of farms costed ..	18			48		
Acreage	426			1005		
	£	s.	d.	£	s.	d.
Gross costs	37	0	0	48	10	10
Value of beet ..	52	7	0	52	11	1
Cash return	15	7	0	4	0	3
Add net residues and tops	7	7	10	9	19	1
Presumed real net profit	22	14	10	13	19	4
	Tons.			Tons.		
Yield of clean beet ..	12·0			11·65		

Labour was the main individual crop item which increased in 1946. Capricious weather also prevailed at critical periods. Other tables give the distribution of yields, distribution of net costs per acre and per ton, distribution of net profit or loss per acre, etc.—G. M. H.

EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE ECONOMICS DEPARTMENT. Fmrs' Leafl. No. 2. **1946 crop costs studies. 1.—Sugar beet.** By *J. D. Nutt.* 1947. pp. 6. [Mimeographed.] **381**

Complete records were obtained for 22 crops on 20 farms—two farms keeping records for two separate crops. Compared with the previous year, results were unfavourable ; the average cost of growing one acre was £38 12s. 0d. which was 7·5 per cent higher than in 1945, whilst the cost per ton at £6 10s. 5d. represented an increase of 66 per cent.

It remains to be seen from the investigations of the 1947 crop whether or not a place for sugar beet in the farming economy of this area can be justified.—P. M.

OREGON AGRICULTURAL EXPERIMENT STATION. Sta. Bull. 437. **Sugar beet seed production in Oregon.** By *R. A. Pendleton, H. E. Finnell,* and *F. C. Reimer.* 1946. pp. 23. **382**

Western Oregon is well suited for the production of nearly all the American seed varieties of *Beta vulgaris* var. *rapa.* The soil and climatic conditions of the Willamette Valley are particularly suitable for this crop, which is, however, very exacting in its fertility requirements, and therefore demands heavy additions of ammonia sulphate and sodium nitrate. Before planting, all fields should receive about 150 lb. of gypsum and 30 lb. of borax per acre. Many aspects of cultivation and rotation are discussed, including the time and rate of planting, row spacing, and cross blocking. Supplemental irrigation amounting to about 6 acre-ins. during the season is usually profitable, and increases of 1400 lb. of seed per acre have been obtained by this means. Under favourable conditions, total yields of 5000 lb. of seed per acre have been obtained, and stands of from four to ten beets per foot of row in 24-in. row widths have proved most satisfactory. So far, Western Oregon has been fortunate in avoiding diseases to sugar beet seed, and only minor outbreaks have required attention, but damage from insects, particularly lygus bugs, has been considerable in some years and preventive measures are suggested.—M. E. E.

FÖRSÖK OCH FORSKNING. Enkornsfrö och tvänhackning. [**"Mono-germ" seed and transverse harrowing.**] *Försök och forskning* **4.** 86. 1947. **383**

In Sweden, experiments have been conducted in recent years by the Sugar Company, in which so-called "mono-germ" seed of sugar beet has been sown, the object being to facilitate singling of the crop. The rate of seeding of "mono-germ" seed is about half that of ordinary seed.

With "mono-germ" seed, the time spent in singling has been reduced on the average by 30 per cent. Such seed can, however, be profitably used only on soils with good germination conditions. There is a slight reduction in yield, but this has, on the average, not exceeded 2 per cent. In a few experiments mechanical transverse harrowing has given promising results, but further experimentation is necessary before a definite pronouncement can be made.—R. P. J.

КУЛЕШОВ, Н. Н. О всхожести семян свёклы в восточных районах СССР и о методике её определения. *Доклады Всесоюз. Акад. С.-Х. Наук* 1946. № 5-6, стр. 9-14.

KULEŠOV, N. N. [**Germination of beet seed in the eastern regions of U.S.S.R., and methods for its determination.**] *Doklady Vsesojuz. Akad. S.-H. Nauk* 1946. No. 5–6. pp. 9–14. [S. M. Kirov Agric. Inst., Omsk] **384**

The germination capacity of any seed which is not old or mechanically damaged is dependent on two factors, namely the conditions of seed development and ripening on the standing crop, and methods of harvesting and storing. The determination of potential germination, that is, the germination capacity of the seed on the standing crop up to the time of harvest, is thus of primary interest.

The lowered germination in beet seed in the eastern regions of U.S.S.R. may be attributed not only to lack of skill in harvesting operations but also to a deficient root growth, which deficiency in turn affects time of seed setting and development. From roots which are late and poorly developed the seeds do not germinate as well as from roots formed earlier. There is urgent need to adopt measures described in order to produce beet of larger size in the eastern area concerned.—M. H.

MINNESOTA AGRICULTURAL EXPERIMENT STATION. Bull. 391. **Yield and nutrient content of sugar-beet tops.** By *L. E. Dunn* and *C. O. Rost.* 1946. pp. 8. **385**

There has been an increasing interest among beet growers of the Red River Valley as to the feeding value of sugar-beet tops and their value of fertilizer when ploughed under. Tops are high in crude protein and minerals, and feeding tests indicate that they are about equal to alfalfa hay. They are also a good source of nitrogen and potassium when ploughed under, the value per acre of the elements returned to an average acre being about $22·00.—R. O. W.

MICHIGAN AGRICULTURAL EXPERIMENT STATION. Tech. Bull. 203. **The effect of time of application and levels of nitrogen, phosphorus, and potash on the growth of sugar beets with a detailed statistical procedure of confounding in a 3×3×3 design.** By *J. F. Davis, W. D. Baten,* and *R. L. Cook.* 1946. pp. 40. **386**

The subject matter is treated statistically. Certain agronomic conclusions can be drawn from the results. When used as a side dressing, application of the whole of the fertilizer about seven weeks after planting proved better than either two or three split applications. Yields of *Beta vulgaris* were not affected by levels of application of these fertilizers. Treatment did not significantly affect the yield of beet tops, but affected the percentage of nitrogen in the leaves.—D. B.

Gouère, A. À propos de la fumure potassique de la betterave à sucre. [**Potassium fertilizer for sugar beet.**] *Potasse* **21.** 23–24. 1947. **387**

Figures are given to show increased production of roots following the use of potassium chloride. Experience in the Paris basin during the past 15 years indicates that for sugar beet cultivation the soil requires an addition of potassium chloride at the rate of 400 kg. per ha. A 20 to 25 per cent increase in yield can then be obtained.—D. B.

ВЛАСЮК, П. А. и СИРОЧЕНКО, И. А. **Влияние различных систем питания на состав и физиологические свойства сахарной свёклы.** *Сахар. Промышл.* 1947. № 7, стр. 41-3.

Vlasjuk, P. A., & Siročenko, I. A. [**Effect of different systems of nutrition on the structure and physiological composition of sugar beet.**] *Sahar. Promyšl.* 1947. No. 7. 41–43. [Inst. Pl. Physiol. and Agrochem., Acad. Sci., U.S.S.R.] **388**

In the sugar industry there is obtained, on an average, only 13·5 per cent of sugar from the 17·5 to 18·0 per cent contained in beet. From the type of beet usually grown it is not always possible to obtain a high sugar extraction, and work has therefore been in progress at the above Institute to determine the effect of nutrition on sugar content. The need for a complete organic-mineral fertilizer (50 per cent farm manure and 50 per cent mineral fertilizer) is stressed, and is indicated by the following data :—

	Type of fertilizer.			
	Control.	Mineral.	Organic.	Organic + Mineral.
Root yield centn./ha. ..	200·3	231·8	206·6	246·8
Sugar yield centn./ha. ..	31·4	39·4	32·0	40·0
Ash % abs. dry weight ..	2·8	3·26	4·18	4·22
N % abs. dry weight ..	1·08	1·15	1·22	1·26
P % abs. dry weight ..	0·094	0·103	0·089	0·123
K % abs. dry weight ..	0·74	0·74	0·72	0·73
Sugar % abs. dry weight ..	70·8	71·1	67·1	69·8

—M. H.

Crowther, E. M. **The use of salt for sugar beet.** *Sugar Beet Rev.* **16.** 19–22. 1947. **389**

It is recommended to give all beets approximately 3 cwt. of agricultural salt per acre at any convenient time well before sowing, unless the necessary sodium can be supplied in other fertilizers, e.g. nitrate of soda or low-grade potash salt.

Seven years' experimental work show that on the average 2 cwt. of muriate of potash gave 2·8 cwt. of extra sugar per acre, an increase of 7 per cent ; 5 cwt. of salt per acre gave 5·1 cwt. of extra sugar per acre, an increase of 16 per cent. This applied for all soils except fen soils. —P. M.

Leach, L. D. **Effect of downy mildew on productivity of sugar beets, and selection for resistance.** *Hilgardia* **16.** 317–334. 1945. [Received 1947.] [California Agric. Expt. Sta.] **390**

Results of trials during two years indicate that *Beta vulgaris* var. *rapa* plants infected with the disease caused by *Peronospora schachtii* produce from 30 to 40 per cent less sugar than healthy beets growing in the same field. Several commercial varieties grown on the Pacific Coast were compared for their susceptibility to downy mildew. Although no satisfactory control for the disease, resistance has been considerably improved by progeny testing and selection.—M. E. E.

Hale, J. B., Watson, M. A., & Hull, R. **Some causes of chlorosis and necrosis of sugar-beet foliage.** *Ann. appl. Biol.* **33.** 13–28. 1946. [Rothamsted Exp. Sta., Harpenden, J. B. H., and M. A. W., and Midland Agric. Coll., Sutton Bonington, Loughborough (R. H.)] **391**

The symptoms and characteristics of two virus and one fungus disease and four nutritional disorders of sugar beet which cause chlorosis and necrosis of the foliage are described. The causes of the diseases and methods of distinguishing between them have been investigated. Experiments have shown that sugar-beet yellows virus and magnesium deficiency can be visually distinguished. It has also been found that magnesium deficiency symptoms are associated with low magnesium content of the foliage, that "potash" deficiency symptoms are often, but not necessarily, associated with a low potassium analysis, and may actually be caused solely by a deficiency of sodium and that manganese deficiency symptoms are associated with low manganese content of the leaves. Sugar beet yellows virus reduces the potassium but slightly increases the magnesium content of the leaves.—G. M. H.

KOTILA, J. E. **Rhizoctonia foliage blight of sugar beets.** *J. agric. Res.* **74.** 289–314. 1947. **392**

DE ROUBAIX, J., & LAZAR, O. **Vernalization of sugar beet.** *Nature, Lond.* **159.** 442. 1947. [Raffinerie Tirlemontoise, Lab. Recherches, Tirlemont, Belgium] **393**

Confirmation has been obtained that vernalization treatment given to sugar beet after radicle emergence has no effect on bolting.—M. H.

VALENTIN, J. La betterave fourragère dans la région de l'Ouest. Importance de la variété et de la fumure potassique. [**Forage beet in the west. Importance of variety and of potassium fertilizer.**] *Potasse* **21.** 36–47. 1947. **394**

The nutritive value of the beet is a function of the sugar content. The yields of the three varieties tested, reckoned as kg. sugar per ha., are: white 3·959, yellow 3·956, half-sugar 5·770. These figures show the superiority of the half-sugar variety. Addition of potassium chloride had a marked increase on yields of all three varieties.—D. B.

ROOT CROPS

NORTH OF SCOTLAND COLLEGE OF AGRICULTURE AGRICULTURAL ECONOMICS DEPARTMENT. Econ. Rep. No. 6. **Enterprise cost of 1945 turnip crop.** By *Albert D. Imper* and *J. Clark.* 1946. pp. 4. [Mimeographed.] **395**

It is argued that the turnip crop, although having the first use of the cleaned land, only bears the same share of benefits as subsequent crops in the rotation.

Investigations were carried out on 474 acres on 38 farms throughout the College area. Two tables are presented. Table I gives the cost per acre of growing turnips, pulling and carting them to the shed or dump. Calculations are on total acreage, hence every acre carries its own weight. Gross cost is estimated at £30 7s. 0d. per acre. Manurial residues and cleaning costs carried forward bring the total net cost to £21 4s. 9d. Table II was compiled from the same primary data, but the cost per acre has been worked out for each farm and the results averaged, so that this cost is weighted per farm. Total gross cost is £30 14s. 2d., and the total net cost £21 5s. 5d.

Close agreement of the two sets of figures indicates that results were not influenced by size of fields or different operational treatments used, and hence the results were reasonably correct for the area.—P. M.

SCHØYEN, T. H. Kålgallmyggen. [**Contarinia nasturtii.**] *Norsk Landbr.* **11.** 18–19. 1945. **396**

The insect causes considerable injury to the swede crop, but turnips suffer less severely. If an attack is feared, treatment should be carried out before it becomes apparent, i.e. in mid-June, the normal time for egg-laying. Later, treatment should be repeated at least twice at intervals of one week. In German trials, the injury was reduced to one-tenth by three treatments. Insecticides are Duphinal (for dusting) and Parexan (for spraying). Gesaral has given good results by spraying with 1 per cent solution. Manuring with cyanamide and Karnit (50–100 kg. per dekar) has reduced the number of larvae in the soil.—R. P. J.

THOMAS, D. C. **A study of the distribution of the swede midge (*Contarinia nasturtii Kieffer*) in Devon, and symptoms of its attack on various host plants.** *Ann. appl. Biol.* **33.** 77–81. 1946. [Seale-Hayne Agric. Coll., Newton Abbot, Devon] **397**

The attack on cow cabbage is most severe in the north and west of the county, while attack on swedes is heaviest in the south and east of the county; the causes of this phenomenon are considered. The life history of the insect is discussed in relation to farming procedure with various crops. Short descriptions and photographs are given of the general symptoms of damage by the midge on the more important cruciferous crops.—Author's summary.

WOODMAN, R. M., & JOHNSON, D. A. **Plant growth with nutrient solutions. IV.—The influence of culture solutions of varying phosphate content on the growth of the turnip in fen and gravel soil.** *J. agric. Sci.* **37.** 163–198. 1947. [Hortic. Res. St., School of Agric., Univ. of Cambridge] **398**

Statistical experiments to ascertain the effect of variations in applied soluble phosphate on the growth of Milan Strap-leaved Purple Top Turnips in a light gravel soil already containing sufficient available phosphate, and in a fen soil possessing an inadequate supply of available phosphate, as aggregates for growth.—G. M. H.

PLANT NUTRITION

BEATER, B. E. **The value of pre-liming, primarily as a means of improving the absorption of phosphorus by plants.** *Soil Sci.* **60.** 337–352. 1945. [Exp. Sta. of South African Sugar Assoc., Mount Edgecombe, Natal] **399**

In *Zea mays* and *Saccharum* pre-liming generally resulted in a 20 per cent increase in the concentration of phosphate in the dry matter and also an increase in the concentration of nitrogen and calcium.—D. B.

Harmer, P. M., & Benne, E. J. **Sodium as a crop nutrient.** *Soil Sci.* **60.** 137—148. 1945. [Michigan Agric. Exp. Sta., East Lansing] **400**

A survey of the American and European literature leads to the conclusion that crops may be grouped as those which benefit by sodium (*a*) in a deficiency and (*b*) in a sufficiency of potassium. Sodium has definite functions only in the latter group. The list of such crops includes the following which show much benefit from sodium: mangel, sugar beet, table beet, turnip, celery, and Swiss chard.—D. B.

Sayre, C. B., & Vittum, M. T. **Substitution of sodium for part of the potassium in mixed fertilizers.** *J. Amer. Soc. Agron.* **39.** 153–161. 1947. [New York State Agric. Exp. Sta., Geneva] **401**

Glycine soja and *Beta vulgaris* gave strikingly different responses to various potassium and sodium levels. For beets, the partial substitution of sodium for potassium would be a profitable practice. For soybeans, a relatively high level of potash with no sodium gave the best results.—D. B.

КАТАЛЫМОВ, М. В. О выносе бора из почвы урожаями сельскохозяйственных культур. *Доклады Акад. Наук СССР.* Том 53. № 9, стр. 829-32. 1946.

Katalymov, M. V. **On the uptake of boron from soils by farm crops.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **53.** 821–825. 1946. **402**

The study was made with plants taken from both industrial and experimental fields of the Dolgoprudy Experiment Station at the time of harvesting, from plots which had never received boron or lime fertilizer. The uptake of boron by grain crops varies (in grm. per ha.) from 20 to 40, that by flax from 35 to 70, clover hay from 47 to 94, potato from 53 to 106, and fodder root crops from 51 to 102.—M. H.

Ramamoorthy, B., & Desai, S. V. **Preliminary studies of the nutritional diseases of plants and their spectroscopic diagnosis.** *Indian J. agric. Sci.* **16.** 103–111. 1946. [Imp. Agric. Res. Inst., New Delhi] **403**

Minor element deficiency diseases were recorded for tobacco, wheat, barley, and betelnut. Methods of spectroscopic analysis were employed in the study of affected plants and soils. In each case an excessive element had to be corrected in order to effect a cure and restore the nutrient balance in the soil.—M. E. E.

Eisenmenger, W. S., & Kucinski, K. J. **Relationship of seed plant development to the need of magnesium.** *Soil Sci.* **63.** 13–17. 1947. [Massachusetts State College] **404**

Experiments on species representing a wide evolutionary range were studied as regards magnesium needs. The following quotation summarizes the results :—

"It was found from many studies that the families of seed plants in the lower stages of evolutionary development always show magnesium needs. Some of the intermediate families also show symptoms of magnesium deficiency. Among the extremely highly developed plants, none show the deficiency except a few isolated members that may have been greatly changed by man through domestication and hybridization. Among these is corn. Potatoes and one or more species of cucurbita, which do not belong to the most highly developed group, but which are, nevertheless, fairly well developed plants, may also be included."—D. B.

Zimmerman, Miryam. **Magnesium in plants.** *Soil Sci.* **63.** 1–12. 1947. [New Jersey Agric. Exp. Sta.] **405**

The part played by magnesium as a constituent of chlorophyll, as a phosphate carrier, in carbohydrate production and transport, and in accumulation of nitrogen in legumes, its accumulation in seeds, and the effect of high concentrations of potassium and calcium on plant absorption of the element are reviewed.—D. B.

Cooper, H. P., Paden, W. R., & Garman, W. H. **Some factors influencing the availability of magnesium in soil and the magnesium content of certain crop plants.** *Soil Sci* **63.** 27–41. 1947. [S. Carolina Agric. Exp. Sta.] **406**

Since most plants selectively absorb the stronger nutrient, the magnesium content usually ranks third or fourth in quantity of metallic nutrients in plants. The stronger nutrient ions in the nutrient complex may definitely influence the solubility as well as the absorption of the relatively weaker magnesium ion.

In the metallic content of plants in humid climates, magnesium is exceeded only by potassium and calcium, which suggests that magnesium may be the next metallic nutrient that should be generally included in mixed fertilizer where heavy applications of fertilizer are common and relatively heavy yields of vegetative crops are expected. It is very probable that a deficiency of magnesium available to plants is a limiting factor in crop yields on many humid soils.

Crops containing a relatively large quantity of magnesium such as potatoes, cotton, tobacco, tomatoes, and other vegetables, often give a marked response, as indicated by yields, to applications of magnesium in mixed fertilizers. The addition of large quantities of sulphates, chlorides, or nitrates will increase the solubility of magnesium in the soil and result in a heavy loss of magnesium through leaching in regions with high rainfall.

A broadcast application of dolomitic limestone may supply the magnesium requirement for a number of years. In the production of high-yielding crops with a short growing season, such as tobacco, cotton, potatoes, and certain vegetables, the addition of the equivalent of 20 to 30 lb. per acre of magnesium oxide in soluble magnesium salts will usually satisfy the annual magnesium requirement on most soils.—Authors' summary.

MacIntire, W. H., Winterberg, S. H., Clements, L. B., & Dunham, H. W. **The effects of calcium fluoride incorporations upon plant growth, fluorine, and phosphorus uptake, and soil pH.** *Soil Sci.* **63.** 195–207. 1947. [Univ. Tennessee Agric. Exp. Sta.] **407**

The studies were conducted in collaboration with the Tennessee Valley Authority, and were undertaken because of the fluorides which are incorporated in small quantities in phosphatic fertilizers. The experiments were planned to ascertain whether additive calcium fluoride serves (*a*) to promote growth on non-legumes and alfalfa, (*b*) to increase the uptake of fluorine and influence phosphorus content in tops and roots, and (*c*) to affect soil pH. As regards (*a*), calcium fluoride had no detrimental effect on seedlings but did not promote growth; as regards (*b*), the fluorine content increased in both tops and roots, but more so in roots.—D. B.

PHYSIOLOGY

Cox, Gertrude M., & Cochran, W. G. **Designs of greenhouse experiments for statistical analysis.** *Soil Sci.* **62.** 87–98. 1946. [North Carolina State College] **408**

Some types of layout that have been applied successfully in greenhouse experiments are illustrated with examples. The major sources of variation in greenhouse experiments are the plant material itself and environmental variations due to structure and location of the greenhouse. A study of replication shows that under greenhouse conditions only large treatment differences can be detected with three or four replicates.—D. B.

Parker, M. W. **Environmental factors and their control in plant experiments.** *Soil Sci.* **62.** 109–119. 1946. [Bur. Plant Ind., Beltsville, Md.] **409**

Methods of controlling light, temperature, humidity, and composition of the atmosphere in the greenhouses at Beltsville are discussed. We are reminded that as the environmental control becomes more refined the area available for growing plants becomes smaller. With some problems it is better to tolerate less exact control in order that larger populations may be grown.

"No particular level of one factor should be referred to as the optimum for growth of a species without specifying at least the approximate levels or conditions of the other important components of the environment. . . . It will be necessary, therefore, to study the interrelationships, the interactions, of all possible factors in the environment before it will be possible to define the optimum "climate" for the growth of a specific plant or organism."—D. B.

Robbins, W. R. **Growing plants in sand cultures for experimental work.** *Soil Sci.* **62.** 3–22. 1946. [New Jersey Agric. Exp. Sta.] **410**

The purpose of the paper is to describe equipment and to discuss some of the factors concerned with a technique of continuous solution renewal which has proved satisfactory for the production of plants excellent in size, productivity, and sensitivity to environmental changes induced by the investigator.—D. B.

Albrecht, Wm. A. **Colloidal clay cultures—preparation of the clay and procedures in its use as a plant growth medium.** *Soil Sci.* **62.** 23–31. 1946. [Missouri Agric. Exp. Sta.] **411**

Colloidal clay, the most active part of the soil, is intermediate between water and soil as substrate for growing plants. Colloidal clay cultures are particularly useful in studying the movements of plant nutrients from the clay into the plant and from the plant into the clay. Degrees of exhaustion of the different nutrients from the clay by particular crop growth and the influence of nutrients on one another can be studied. The method also offers a means of obtaining a chemically accurate balance sheet of nutrient supplies both before and after crop growth (illustrated by results for soybean).

The method of preparing the colloidal clay substrate is described. It may be either a simple aqueous suspension of the clay, or a mixture of clay and quartz sand or of clay and nutrient minerals.—D. B.

Davidson, O. W. **Large-scale soilless culture for plant research.** *Soil Sci.* **62.** 71–86. 1946. [New Jersey Agric. Exp. Sta.] **412**

The factors concerned in the construction and upkeep of the three types of artificial culture (solution, sand, and gravel) are discussed. Each type of culture offers different facilities. The solution culture offers the highest degree of control over the composition of the nutrient substrate and allows convenient access to roots for sampling and observation. Sand cultures give greater support to the growing plant but less control over the nutrient medium. Gravel cultures provide the most favourable conditions of root aeration.—D. B.

Wood, J. W., Mitchell, J. W., & Irving, G. W. Jr. **Translocation of a radioactive plant-growth regulator in bean and barley plants.** *Science* **105.** 337–339. 1947. [Bureaux of Agric. and Industr. Chem. and of Plant Ind., Beltsville, Md.] **413**

Radioactive iodine was used as the tracer atom in 2-iodo-3 nitrobenzoic acid for following the movement of this growth regulator through seedlings of *Phaseolus vulgaris* and *Hordeum vulgare.* The compound was applied as a paste to the leaf. Three days after treatment, radioactivity measurements showed that in the case of *Ph. vulgaris* the compound was absorbed by the leaves, was translocated to stems, and accumulated mainly in terminal buds and hypocotyls; in *H. vulgare* the compound was absorbed and was accumulated mainly in the second leaf. In the bean, growth was inhibited where the compound accumulated, whereas in barley development continued. There is no apparent difference in growth response when either the stable compound or the radioactive compound are applied in equal amounts. With the latter, the path of the compound within the plant can be traced by measurements of radioactivity.—D. B.

Wadleigh, C. H., Gauch, H. G., & Strong, D. G. **Root penetration and moisture extraction in saline soil by crop plants.** *Soil Sci.* **63.** 341–349. 1947. [U.S. Reg. Sal. Lab., Riverside, Calif.] **414**

The study was undertaken to develop a method of quantitatively evaluating the tolerance of plants to saline soils. Plants were grown in vessels containing soil the salt content of which increased with depth from 0·0 at the surface to 0·25 per cent at a depth of 36 in. Plants studied were *Phaseolus, Zea mays, Medicago sativa,* and *Gossypium,* this being, as in the field, the order of increasing salt tolerance. While few bean roots penetrated the layer containing 0·1 per cent sodium chloride, cotton roots were present in abundance even in the soil layer containing 0·25 per cent sodium chloride. Water was removed from each layer to such a degree that final osmotic pressures of all layers in the soil column were nearly uniform. These critical osmotic pressures of the soil solution varied between 7 to 8 atm. for beans and 16 to 17 atm. for cotton.—D. B.

СУХОРУКОВ, К. и БОЛЬШАКОВА, Н. Свободный и связанный гормон клеточного деления в растениях. *Доклады Акад. Наук СССР.* Том 53. № 5, стр. 475-8. 1946.

Suhorukov, K., & Boljšakova, N. **Free and bound hormone of cell division in plants.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **53.** 471–474. 1946. [Tomsk State Univ.] **415**

The study includes observations on wheat and rye cultures, grown up to the 3rd or 5th leaf stage in a light room at 18°C. Some of the pots were transferred to a light room at 4°C., and left 10 days for hardening. In the chilled plants of both species there occurred a breakdown of protein, and the amount of free and bound hormone increased. The breakdown of the protein did not involve the complex proteins of the plasm, but probably occurred at the expense of the reserve proteins. Thus, at chilling temperature in the light, there occurs formation of the hormone and its combination with the proteins.—M. H.

Watson, D. J. **Comparative physiological studies on the growth of field crops. I.—Variation in net assimilation rate and leaf area between species and varieties, and within and between years.** *Ann. Bot., Lond.* **11.** 41–76. 1947. [Rothamsted Exp. Sta.] **416**

Determinations of net assimilation rate (NAR) and of leaf area per plant or per metre of drill row were made at intervals throughout the growth of field crops of wheat, barley, potatoes, mangolds, and sugar beet at Rothamsted. Data are presented from 15 experiments in six years. The experiments included comparisons of varieties of the same crop, and of sowings made on different dates.

Net assimilation rate was much less variable between years and between varieties of the same species than leaf area. Consequently, the differences between years and varieties in yield of dry matter reflected mainly the differences in leaf area, and showed no close relation to the much smaller differences in NAR. Similarly, differences between species in yield of dry matter were accounted for almost completely by differences in leaf area, in spite of the wide variations in NAR between species. The reason is that in different species the production of leaf area occurred at different stages of the seasonal cycle of NAR. In general, variation in leaf area was the main factor determining differences in yield; variation in NAR was of minor importance.—Author's summary.

ОКУНЦОВ, М. М. Влияние меди на фотосинтез и дыхание растений. *Доклады Акад. Наук СССР.* Том 54. № 8, стр. 737-8. 1946.
OKUNCOV, M. M. **Effect of copper upon photosynthesis and respiration of plants.** *C.R. (Doklady) Acad. Sci. U.R.S.S.* **54.** 733–734. 1946. [Lab. Photosynthesis, Tomsk State Univ.] **417**

When introduced into the leaves of various plants a copper sulphate solution (concentration 0·0001 *M*) has no effect on intensity of photosynthesis, but respiration is modified in different degrees, depending on the species. It causes a decrease in potato, sunflower, and sugar beet and an increase in maize.—M. H.

WASSINK, E. C. **Photosynthesis as a light-sensitized transfer of hydrogen.** *J. Microbiol. Serol.* **12.** 281–293. 1947. [Biophysical Res. Group, Utrecht-Delft] **418**

The application of comparative biochemistry to the study of the chemical activities of micro-organisms.—R. O. W.

WHYTE, R. O. **Developmental behaviour of crops. Some practical applications.** *J. Minist. Agric.* **54.** 292–6. 1947. **419**

A review of the application of recent work on the physiology of reproduction of plants in farming practice, with reference to a number of crops, including herbage plants.—R. O. W.

BORTHWICK, H. A. **Photoperiodic response as a factor in choice of plants for testing soil deficiencies.** *Soil Sci.* **62.** 99–107. 1946. [Bur. Plant Ind., Beltsville, Md.] **420**

After a discussion of the part played by length of day in the type of plant development, some equipment for regulating the day length given to test plants in greenhouses is described. The equipment and methods are designed for precision of timing, for maintaining ventilation of covered plants and for minimizing temperature increases consequent upon covering the plants.

" . . . Plants accumulate materials from the soil at varying rates throughout the season. These rates are probably more closely correlated with the type of development through which the plant is passing at a particular time than with the actual age of the plant. Considerable emphasis, therefore, is placed on the advantages resulting from the use of test plants the development of which can be rather sensitively regulated by photoperiodic control."—D. B.

FUNKE, G. L. **Observations on the flowering photoperiodicity.** *Rec. trav. bot. néerland.* **40.** 392–412. 1943–45. [Bot. Inst. Govt. Univ., Leyden] **421**

Plants receiving full daylight from 7 a.m. to 3 p.m. daily were at that hour either darkened or received a further four hours of white, blue, or red light of approximately equal intensities. Plants fall into four groups, irrespective of their photoperiodic categories, according to their reaction to red and blue light. In Group 1, the response to red and to white light is similar; in Group 2, both red and blue have the same effect as white light; in Group 3, red and blue produce the same response as darkness; while in Group 4, blue light is equal to white and red to darkness. Plants in this last group are mostly Crucifers. *Anthemis tinctoria* is a long-day plant in Group 1. One month of long-day induction in April is effective, but similar periods of short days are without a retarding effect. Flowering is suppressed in both seedlings and grown plants when during four hours of each long day the light is blue, and in seedlings this also checks vegetative growth. *Iberis amara* is a long-day plant in Group 4. *Glycine hispida* and *G. soja* are short-day plants in Group 1. Blue light, however, has an effect on vegetative growth similar to that of white light. High night temperature is here a more potent factor in flowering than is daylength. Two species of *Hedera* are short-day plants in Group 1. All species of *Sedum* tested are short-day plants, but include members of Groups 1, 2, and 4.

Perilla ocymoides and *P. nankinensis* belong to Group 2. After prolonged short-day induction, the life cycle is completed in long days, and the plants die after fruiting, but a shorter induction period leads to flowering followed by reversion to vegetative growth. This is attributed to relative production of florigen in short days and of auxin in long days.—O. N. P.

ТУМАНОВ, И. И. и ЛИЗАНДР, А. А. О физиологическом действии на растения триодбензойной кислоты. *Бот. Ж. СССР.* Том 31. № 3, стр. 13-21. 1946.
TUMANOV, I. I., & LIZANDR, A. A. [**The physiological action of triodobenzoic acid on plants.**] *Bot. Ž. S.S.S.R.* **31.** 13–21. 1946. [Timirjazev Inst. Pl. Physiol., Moscow] **422**

Greenhouse experiments made with *Perilla nankinensis*, *Medicago sativa*, species of *Linum*, *Helianthus*, *Triticum*, and *Pisum* are reported. Sensitivity of the plants to treatment varied. *M. sativa* was specially affected, and morphological changes were induced. These changes again varied depending on whether the plant had been grown in natural long day or short day. Thus, if the plants were grown in long day, the acid changed the direction of cell growth, but in short day (when growth is slow) the growing points were mainly affected, the distribution of primordia being changed and the resulting organs being modified.

Spraying with weak solution of the acid (0·001 per cent) at the beginning of flowering in long day resulted in increased seed yield of alfalfa. The tests also included treating swollen seeds with varying concentrations of the acid in order to study effect on meristematic tissues. In these cases also, differing sensitivity was noted.—M. H.

ЧАЙЛАХЯН, М. Х. Развитие различных видов заразихи в связи с ростом и развитием растений-хозяев. *Доклады Акад. Наук СССР*. Том 55. № 9, стр. 881-4. 1947.

Čaĭlahjan, M. H. **Development of different species of broomrape as connected with growth and development of their hosts.** *C.R.* (*Doklady*) *Acad. Sci. U.R.S.S.* **55.** 869–872. 1947. [Timirjazev Inst. Pl. Physiol., Moscow] **423**

The appearance and flowering of stems of different *Orobonche* species is independent of the stage of development of the host plant, but there is support for the view that in parasitic heterotrophic plants the hormones of flowering are formed from such substances and under such conditions which prevent autotrophic plants from forming florigenous substances. The development of *Orobanche* is connected with the growth rate of the host plant, rapid growth limiting development of the broomrape. When studying potential susceptibility of crops to broomrape infection, attention should be given to testing long-day and neutral species under short-day conditions, and short-day species should be tested under long-day conditions.—M. H.

PLANT BIOCHEMISTRY

Hopkins, D. P. **Fertilizers and nutritional values.** *Farming* **1.** 306–308 and 315. 1947. **424**

Fertilizers can affect the nutritional value of a crop in two ways—firstly, through the ordinary increase of the crop quantity and secondly, through an actual change in the composition of the crop. One hundred-weight of sulphate of ammonia applied per acre reduced the sugar percentage of beet juice by 0·1 per cent, but this depression was insignificant compared with the large increases shown in sugar beet yields per acre. Also the supply of potash offset or minimised the qualitative depression of nitrogen. Beet yields are powerfully stimulated by nitrogen, but usefully stimulated by phosphates and potash, while the sugar percentage is consistently depressed by nitrogen, unaltered by phosphates and raised slightly by potash. These plant-food effects are similar in trend whether sugar is being raised by beet in temperate countries or by cane in hot and tropical areas.

With proteins the effect of nitrogenous fertilizers both quantitatively and qualitatively is strongly positive. Not only is the yield of grass increased but it contains more protein per lb. Farmers with compost manure available should use it in their arable cropping and not waste it on pastureland. In New Zealand it was found that animal urine strikingly increased both grass yields and protein contents.

If the root part of a plant is to be consumed as food, then phosphorus fertilizing can considerably increase its normal phosphorus value ; but if the grain or leaf part is the food, then this effect is very much smaller. Manures and fertilizers should be used as partners as complementary soil amendments for high cropping.—G. M. H.

ФЕДОРОВ, М. В. Влияние азотобактера и клубеньковых бактерий на азотный баланс почвы и урожай с.-х. растений при внесении в почву соломы и последовательной культуре бобовых растений и злаков. *Труды сельскохоз. Акад. Тимирязева* 1945. Вып. 30, стр. 57-74.

Fedorov, M. V. [**The influence of *Azotobacter* and nodule bacteria on the nitrogen balance of the soil, the yields of crops resulting from the incorporation of straw with the soil, and the subsequent cultivation of leguminous plants and cereals.**] *Trudy seljskohoz. Akad. Timirjazeva* 1945. No. 30. pp. 57–74. **425**

The influences of the following soil treatments on the yield and nitrogen content of peas and oats were compared : (1) Control—no manure ; (2) PK ; (3) NPK ; (4) PK + powdered oat straw ; (5) PK + inoculation with *Azotobacter* ; (6) PK + powdered oat straw + *Azotobacter*. The peas and oats were grown in pots, either separately or with equal numbers of each species together in one pot ; but all were submitted to the treatments explained above.

The temporary withdrawal of available nitrogen from the soil during the decomposition of newly incorporated straw could be nullified by the sowing of a mixture of oats and peas. The nodule bacteria rendered the leguminous species largely independent of nitrogen available in the soil, and the oats were benefited by their combination with the peas. There is no need to fallow the land in order to facilitate the decomposition of the straw, and the straw promoted vigorous bacterial fixation of nitrogen.

The function of *Azotobacter* still requires further elucidation. There is indication that the bacteria play a useful part in nitrogen fixation (though quantitatively not so large as that of the nodule bacteria); but their usefulness as a soil inoculant is not very marked. They fail to prevent the reduction of the yield of oats grown without peas and in soil containing newly incorporated straw powder.—I. Z.

KRAUS, E. J., & MITCHELL, J. W. **Growth-regulating substances as herbicides.** *Bot. Gaz.* **108.** 301–350. 1947. [Univ. Chicago (E.J.K.) and Bur. Plant Ind., Beltsville, Md. (J.W.M.)] **426**

Publication of these results has been delayed for security reasons because the work became part of an established programme on biological warfare (crop destruction as a means of national defense). It was not known to the authors that work on growth regulators as herbicides was already well advanced in Great Britain.

2,4-Dichlorophenoxyacetic, 2,4,5-trichlorophenoxyacetic, and 4-chlorophenoxyacetic acids proved extremely toxic when applied to the aerial parts of dicotyledonous plants (sugar beet, radish, rape, kidney bean, red clover, and buckwheat). With the exception of rice, and to some extent barley, cereals were relatively insensitive. Dusts containing growth regulators were relatively ineffective. The addition of a hygroscopic agent provides the conditions for the growth regulator to induce growth responses and severe injury.—D. B.

JONES, D. B., & DIVINE, J. P. **The protein nutritional value of soybean, peanut, and cottonseed flours, and their value as supplements to wheat flour.** *J. Nutrit.* **28.** 41–49. 1944. [Bur. Human Nutrition and Home Economics, U.S. Dept. Agric., Washington] **427**

Sprouted legumes are an excellent source of ascorbic acid, a fair source of riboflavin and nicotinic acid, and a poor source of thiamine. Peas (*Pisum sativum*) were superior to soybeans (*Glycine soja*), which, in turn, were superior to other beans (*Phaseolus vulgaris*) in production of these water-soluble vitamins. Both germination and generation of vitamins proceeded at a greater rate with increased temperature.—D. B.

СУТУЛОВ, А. Н. Изменение углеводного обмена у растений как показатель водоснабжения. *Доклады Всесоюз. Акад. С.-Х. Наук* 1946. № 11-12, стр. 31-4.

SUTULOV, A. N. [**Alteration of the carbohydrate metabolism in plants as an index of the rate of water supply to the plant.**] *Doklady Vsesojuz. Akad. S.-H. Nauk* 1946. Nos. 11–12. pp. 31–34. [Cent. Res. Inst. Starch and Molasses Industry] **428**

Observations made on stored potatoes revealed the following facts: (1) temperatures within a range of 0° to 30°C. and dehydration produced an increase in the rate of cleavage of starch; (2) the latter was accompanied by the accumulation of saccharose, particularly after a substantial dehydration; (3) the process was reversible; for (4) in tubers placed in a chamber at 10° to 15°C. with sufficient humidity, a considerable proportion of sugar was reconverted into starch. Subsequent experiments with growing tubers showed that the same train of phenomena took place under natural conditions. In particular, the ratio saccharose : monose was found to be a fair index of unfavourable water supply, growing steadily parallel with the decrease of the amounts of water available for the plant. Growing tubers subjected to air and soil drought stored up smaller amounts of monose and greater amounts of saccharose. The saccharose : monose ratio plotted as a curve will indicate when the plants require additional watering.—H. F.

ELEMA, B. **The Zbinden method for the micro-estimation of copper after preliminary deposition of the metal by electrolysis.** *J. Microbiol. Serol.* **12.** 243–256. 1947. [Lab. "N.V. Nederl. Gist. en Spiritusfabrick," Delft] **429**

Zbinden's method for estimating micro-quantities of electrolytically separated copper by reversal of current has been investigated. Though the theoretical basis of the method proved to be more intricate than was to be expected from Zbinden's papers, standardization of the experimental conditions resulted in the development of a simple method for the determination of from 10–100 μg. of copper. This method is very well adapted to routine work, and may be carried out by untrained or hardly trained personnel.

Without doubt, essentially the same procedure may be used for the estimation of greater quantities of copper. In that case, standardization at a higher amperage of the dissolving current seems advisable.—Author's summary.

BERTRAND, G., & BERTRAND, D. Recherches sur le rubidium des phanérogames. [**Researches on rubidium in phanerogams.**] *Ann. agron., Paris* **17.** 149–153. 1947. **430**

Tabulated results of recent quantitative analyses show that of the species studied the rubidium content is almost three times as high in the Cruciferae as in the Leguminosae and Gramineae; the average figures for rubidium per kg. of dry matter in these families are respectively 46·1, 16·1, and 16·8.—D. B.

GERMINATION

PORTER, R. H., DURRELL, MARY, & ROMM, H. J. **The use of 2,3,5-tryphenyl-tetrazolium-chloride as a measure of seed germinability.** *Plant Physiol.* **22.** 149–159. 1947. [Iowa State College, Ames] **431**

Tetrazolium chloride is a colourless salt which, on reduction, forms non-diffusible carmine red formazans. It is therefore an oxidation-reduction indicator. The active respiration of the tissues of a germinating embryo can bring about this reduction. Germinability of seeds of *Zea mays*, *Hordeum vulgare*, *Avena sativa*, *Triticum aestivum*, *Fagopyron esculentum*, *Oryza sativa*, *Paspalum notatum*, *Holcus sorghum*, *Glycine soja*, *Vicia sativa*, and *Pisum sativum*, was tested by this method, and results compared with germination by approved methods.

The criterion used for classifying grass seeds as viable was the almost complete staining of the embryo and scutellum. The method appears to be unsuitable for legumes and for cotton.—D. B.

HSUEH, Y. L., & LOU, C. H. **Effects of 2, 4-D on seed germination and respiration.** *Science* **105.** 283–285. 1947. [Tsing Hua Univ., Kunming, China] **432**

Experiments on *Hordeum vulgare*, *Oryza sativa*, *Triticum*, *Glycine soja*, *Vicia faba*, *Arachis hypogaea*, and *Raphanus* are reported.

At low concentrations (0·01 per cent) 2, 4-D promotes germination, but at concentrations of 0·1 per cent it begins to inhibit aerobic respiration and hence retards germination. Seeds treated with 2,4-D cannot easily use oxygen of the air during germination and have to obtain their energy supplies from fermentation. Rice is gifted with a highly functional fermentative mechanism, and therefore germination after treatment with 2,4-D proceeds for a longer period than in the other crops.—D. B.

ENVIRONMENTAL STUDIES

NUTTONSON, M. Y. **Agroclimatology and crop ecology of Palestine and Transjordan, and climatic analogues in the United States.** *Geogr. Rev.* **37.** 436–456. 1947. **433**

A study to organize, define, and analyse the various distinct agroclimatic conditions in Palestine and Transjordan and to compare them with agroclimatic conditions in the U.S.A. in order to discover "climatic analogues" (places sufficiently similar with respect to some of the major weather characteristics affecting crop production to offer a fairly good chance for the successful introduction of plant material from one area to its climatic counterpart). Meteorological data—mean monthly and yearly temperatures, average monthly, seasonal, and yearly precipitation, precipitation-effectivity indices and ratios (Thornwaite's method), relative humidity, and latitudes—were the main sources of material. The crops grown, the crop geography, and the physiographic and soil characteristics of the various physical belts of Palestine and Transjordan were also considered. Analogues for irrigated crops were worked out mainly on the basis of temperature and relative humidity and a further check of established climatic analogues was obtained through a comparative study of phenological data. On the basis of similarity of precipitation distribution, precipitation-effectivity indices, and, in most but not all cases, temperatures and relative humidity the U.S. climatic analogues are limited mainly to the southern part of the State of California but for some stations the temperatures and the summations of heat units were found to correspond more nearly to those of parts of southern Texas and Arizona. The relative humidity of a considerable number of Palestine stations is too high for even the southern coastal areas of California, and suggests instead areas in the lower Rio Grande Valley of Texas and in southern Florida.—G. M. H.

BOOKS

FORD, D., & SCOTT, RICHENDA. **The native economies of Nigeria.** Edited by *Margery Perham.* 22 × 14. pp. 333. London: Faber and Faber, Ltd., 24, Russell Square. 1946. 25s. **434**

This is the first of two volumes of a study entitled "The Economics of a Tropical Dependency," written with a view to compensating for the little attention that has been given to the colonial field by economists. Nigeria was chosen as the object of the study since it is the largest and in some ways the most economically backward dependency and because a study of the Nigerian economy necessarily includes the study of problems common to other tropical administrations.

Miss Margery Perham, the editor, gives an analysis of the most important aspects of the present economic life of Nigeria in the general introduction to the volume; this is followed by an account by Professor Daryll Forde of the physical character, communications, and peoples of the country. Part I of the volume by Professor Daryll Forde covers Native Economies, in which he distinguishes four basic types of native economy: (*a*) the southern farming economy, characterized by subsistence production of root crops and the production of tree crops for exchange; (*b*) the northern grass farming economy dominated by subsistence production of guinea corn and millets in combination with field crops for export markets; (*c*) the plateau economy characterized by the cultivation of inferior grains with distinctive techniques and organization and a low development of exchange production; and (*d*) the northern pastoral economy dominated by the rearing of cattle for subsistence production of milk and the marketing of stock and their products. Detailed accounts of native economies in various parts of the country follow, together with possible lines of future development and the social problems involved.

In Part II, Dr. Richenda Scott, under the heading "Production for Trade," gives an account of all aspects of Nigerian production of palm products, groundnuts, and cocoa, and the live stock industry, which is an important element in the economic life of the territory.—G. M. HOWE.

DEMOLON, A. Croissance des végétaux cultivés. [**Growth of cultivated plants.**] 3rd. edn. 1946. 26 × 17. pp. 381. 28s. 6d. Paris: Dunod, 92, Rue Bonaparte (VI). **435**

The third edition is substantially the same as the original publication of 1934, but incorporates recent information on the mode of action of growth factors and gives a more generous treatment of the ecological side of agriculture.

As in the former editions, environmental factors are classified as physical, chemical, and biological. The section on physical factors is mainly concerned with light and temperature. Discussion of the biological environment is limited to microbial activity in the soil. By far the largest part of the book deals with the chemical elements and compounds both in the atmosphere and in the soil which have a nutrient function and also those which exert a toxic influence.

Growth and yield are treated mathematically. The section on fertilizers has been enlarged by observations on soil exhaustion, opportunities for which have been afforded by the war-time shortage of fertilizers. The introduction of fresh crops during the war years has widened the field from which data could be drawn.—D. BROWN.

МОСКВА, Всесоюзный Научно-Исследовательский Институт Свёкловичного Полеводства. Научный отчёт за 1941-1942 гг. Москва, 1945. Стр. 192. 14 руб.

MOSCOW, ALL-UNION RESEARCH INSTITUTE OF SUGAR-BEET HUSBANDRY. [**Scientific Report for 1941-42.**] By various authors. 22 × 15. pp. 192. Moscow. 1943. 14 roubles. **436**

The papers in this symposium are grouped under five headings: (1) agricultural technique and chemical fertilizers; (2) selection and breeding; (3) plant protection; (4) mechanization; and (5) economics. Since during the period covered by the report old sugar-beet growing districts were occupied by the enemy, the emphasis is laid upon measures and conditions favouring the establishment of sugar-beet plantations in eastern regions and in the non-black-earth belt of the U.S.S.R. There are five papers in Section 1 (pp. 4-85). These are devoted to (*a*) growing sugar beet under irrigation, (*b*) and (*c*) industrial sugar-beet crops in northern, north-eastern and south-eastern regions of the U.S.S.R., (*d*) saturating sugar-beet seeds with fertilizers, and (*e*) influence of the soil on the efficacy of providing mineral fertilizers during the various phases of growth of cereal crops. In Section 2, there is one paper on selection and breeding of sugar beet in new areas under irrigation. In Section 3, there are two papers on (*a*) life history of and measures for control of *Poeciloscytus cognatus*, *Chaetocnema brevinsola*, and *Phyllotreta vittiba*, and (*b*) ecology of cercosporiasis and its control. In Section 4, there are two papers describing various implements for mechanical cultivation, sowing, and application of fertilizers to cereal and sugar-beet crops. Lastly, in Section 5, there is one paper devoted to seed production in new sugar-beet growing areas.—H. Fox.

CURRIE, A. W. **Economic geography of Canada.** 22 × 15. pp. xiv + 455. Toronto: The Macmillan Co. of Canada, Ltd. 1945. 16s. **437**

The author has decided that the best method of treating the economic geography of a large area like Canada and Newfoundland is to break down the area into smaller divisions or regions and to deal with each in turn. Thus the descriptions of the natural resources of the regions and their use in agricultural production are dealt with under the region concerned, of which the author recognizes seven main ones. The book should be useful to anyone building up a lecture course on the agricultural geography of Canada.—R. O. WHYTE.

BRANDT, K. **The reconstruction of world agriculture.** 14 × 22. pp. xviii + 416. New York : W. W. Norton and Co., Inc. 1945. 25s. [Food Res. Inst., Stanford Univ.] **438**

Probably the chapter of greatest interest to readers is that outlining resonstruction in selected countries. The earlier chapters represent an examination from the economic aspect of the effects of World War I upon world agriculture, agricultural trends in the years between the wars, the impact of World War II upon the world's food economy, agriculture, and the rural community, and similar topics leading up to a discussion of the reconstruction of world trade as the basis for a reconstruction of agriculture.

The last chapter refers to reconstruction in selected countries of Europe, North and South America, and elsewhere, and introduces comments on possible changes in cropping practices, change of emphasis as between one crop and another and between crop and grass, and similar topics. There is, on p. 371, an adaptation of Woermann's interesting chart, showing grain yield, fertilizer use, and density of live stock per ha. in continental Europe. Holland, Belgium, and Denmark lead with 128, 122, and 122 live stock units per ha. respectively, with a correspondingly high use of fertilizers and grain yield, while Spain and Italy have only 25 and 49 live stock units respectively.—R. O. WHYTE.

SANDERS, H. G., & ELEY, G. **Farms of Britain.** 22 × 15. pp. 160. Plts. London : Crosby Lockwood and Son, Ltd., 20, Tudor Street, E.C.4. 1946. 12s. 6d. **439**

This book is based on talks broadcast by the B.B.C. during the winter of 1945-46. Those interested in the talks—a million and a half listeners, among whom there were not a few town-dwellers—will now be able to refresh their memories, and read any talk they may have then missed. The work is written in a simple and direct prose style, which makes it pleasant to read and yet at the same time succeeds in recalling quite vividly the actual talks themselves. The aim is to help farmers generally to a better understanding of the problems of management and to encourage greater enterprise. In this the written word should be even more effective than the spoken word. One fact becomes clear, and it is that the quality of the farmer is of the greatest importance ; it transcends, within fairly wide limits, both soil and situation. As the authors say : "The same farm—in which the uncontrollable factors of soil, climate, and markets are constant—can, and often does, produce quite different results when farmed by two different men." And even if the results are not very different, there will be those variations in emphasis which make the subject of farming of such interest.

"Good management, among other things, lies in the uses to which a farmer puts his labour, how he crops and stocks his land, and how he uses his working capital."

Regarding farm costs, it was found that all the present costing systems were open to various objections, and it proved difficult to get figures to provide a basis for comparison. It was eventually decided to use gross turnover as being " a reasonable standard to judge differences in production per acre and production per man on the different farms." The widely held view that the smaller farms show a more intensive production than larger ones received no support from the evidence obtained. "It is in this question of production that some of the most radical changes of the future may be. British agriculture, based on expensive land, is still organized for high production per acre, but times have altered, and if we are to compete with producers overseas a maximum production per-man-hour will have to become the principal aim . . . the British farmer can least of all afford just to carry on. He must increase his efficiency, and so narrow, as far as possible, the gap between home production figures and world costs."

A chapter is devoted to each farm type. The situation of the farm in relation to the area it represents is clearly indicated in an excellent series of maps. The following list of the chapter headings will show the scope of the work: Mixed farming on the Downs (1,500 acres of chalk); Rich silt land acres (200 acres near the Wash); A clay land farm (380 acres); Home of the Ayrshires (412 acres); Milk from a city hillside at Bradford (80 acres, plus a 200 acre stock-rearing hill farm); A midland grazier (400 acres on Northampton-Leicester border); Breeding Cheviot sheep (2,700 acres); Milk and poultry in Northern Ireland (52 acres); Beef in Aberdeen (85 acres); Three brothers in Wales (157 acres); A Devonian farm (235 acres). The salient features are gathered together and discussed in the summary.—A. R. BEDDOWS.

PELZER, K. J. **Pioneer settlement in the Asiatic tropics.** Studies in land utilization and agricultural colonization in south-eastern Asia. [Amer. Geogr. Soc. Spec. Publ. No. 29.] 26 × 18. pp. 308. Plts. New York, 1945. **440**

One has learnt to regard the familiar grey and black cover of the American Geographical Society Special Publications as a symbol of excellent writing and publishing, and this volume, which will appeal to geographer, agricultural economist, and sociologist alike, once again carries on the valuable tradition of the series.

The first part of the book, which deals with land use in a tropical environment, traces the development of native economy in south-east Asia from food gathering through shifting cultivation to permanent and settled agriculture. There is an interesting discussion on the controversial views which are held regarding shifting cultivation and its effect on the land, about which Dr. Pelzer writes "the practice of shifting cultivation has altered the character of vegetation beyond recognition over wide areas in south-eastern Asia. Instead of a dense primeval rain-forest, we now find extensive open grasslands resulting from the most important tool of the shifting cultivator, fire." These grasslands consist mainly of *Imperata cylindrica*, *I. constricta*, *Saccharum spontaneum*, *Themeda gigantea*, and *Eupatorium odoratum*, and are of no further agricultural use to the shifting cultivator who uses them only for hunting. That such methods, which lead to the wholesale destruction of tropical forest, also induce soil erosion is fully stressed.

In the second and larger part of the book experiments in agricultural colonisation are described in the Phillipines, administered according to independence standards by the U.S.A., and in the Netherlands Indies which are administered according to a colonial standard. Chapter VI gives a detailed study of the agriculture of that most densely peopled island of equatorial regions, Java, and the following chapter deals with the problems of settling her surplus population in the land beyond. The book is beautifully illustrated throughout, and the maps are of a consistently high standard. Appendices, a long list of references, and an index complete a most valuable and dynamic publication.—M. E. EDWARDS.

GENTILLI, J. **Atlas of Western Australian agriculture.** 31 × 25. pp. 50. Crawley. 1941. 5s. **441**

The compilation of 22 maps with fully descriptive text is a valuable addition to the available information concerning the economic geography of Western Australia. Like many agricultural atlases it is printed entirely in black and white, which makes the production of clear maps representing intricate statistical details a very difficult process. The technique here employed does not always achieve complete success, as, for instance, in maps 8 to 11 showing production of fruits where the use on each map of thirteen or more different symbols, representing both fruit types and production amounts, only leads to confusion. The dot distribution method is more successfully employed where a single commodity is being considered as in numbers 2, 4, 13, and 16, and there are good shaded maps showing relative wheat yields, kinds of hay, and density of permanent rural buildings. It is unfortunate that the transparent key sheet with boundaries and place names is printed on a slightly smaller scale than the atlas maps, and that the summer rainfall inset (1A) has no reference to a particular month or months. Apart from these mapping defects, the book, which is far more than an atlas, carries a wealth of agricultural information which should be studied by all who are interested in the future of Western Australia.—M. E. EDWARDS.

GARNER, W. W. **The production of tobacco.** 24 × 16. pp. 529. Philadelphia and Toronto: The Blakiston Company. 1946. 27s. [Formerly Bur. Plant Ind., U.S. Dept. Agric.] **442**

Under the allocation of crops between *Field Crop Abstracts* and *Horticultural Abstracts*, tobacco goes to the latter journal except when its place in farming systems is being considered. For this reason, Garner's "Production of Tobacco" is being dealt with as far as Chapter 5 only (soils and cropping systems for tobacco) is concerned.

The exact grade or quality of leaf which a given soil can produce can be determined only by trial; two apparently similar adjacent soils may produce quite different qualities. The very best soils usually give good results without close attention to detail of management, but careful management and appropriate methods of cropping may be of great value in overcoming deficiencies in less ideal soils on which tobacco is to be cultivated.

A systematic rotation of crops has not come into general use on soils producing flue-cured tobacco. Land may be rested in weeds or broom sedge for a few years, provided the soil is not infested with Granville wilt. Rotational crops must be selected which do not give too much nitrogen nor which favour development of root knot nematodes and other diseases. It is sometimes advantageous to grow cereals after tobacco, since these afford a good winter cover, improve content of organic matter, and do not produce any disease hazard. The principal problem here is to find a crop to follow the cereal; a hay crop may be suitable on the heavier soils. Some workers have found that tobacco does especially well after certain field weeds of the flue-cured area.

There is a similar discussion of the problems and possibilities of crop rotation for Burley, fire-cured, and dark air-cured tobacco soils, for Southern Maryland tobacco soils, and for cigar-tobacco soils. Where a resting break is desirable, this may be either weeds or Kentucky bluegrass or other herbage species.—R. O. WHYTE.

REPORTS

SCOTLAND (SCOTTISH SOCIETY FOR RESEARCH IN PLANT-BREEDING). **Report by the Directors and Report by the Director of Research to the Annual General Meeting, 24th July, 1947.** By *W. Robb.* Edinburgh, 1947. pp. 44. **443**

The research programme regarding oats, barley, wheat, legumes, virus diseases, herbage, and various root crops is reviewed.—P. M.

EMPIRE COTTON GROWING CORPORATION. **Progress reports from Experiment Stations, season 1945-6. Programmes of experiments, season 1946-7.** 1947. pp. 132. **444**

Progress reports for season 1945-46 and programmes of experiments for season 1946-47 from the Regional Experiment Station, Biloela, Queensland; Cotton Experimental Station, Barberton, South Africa; Cotton Research Station, Gatooma, Southern Rhodesia; Plant Breeding Stations, Anglo-Egyptian Sudan; Cotton Experiment Stations, Kawanda and Serere, Uganda; Experiment Stations in Lake Province and Eastern Province, Tanganyika Territory; Cotton Experiment Stations, Nyasaland; Nigeria; and the Cotton Breeding Station, Montserrat, West Indies.—G. M. H.

ONTARIO DOMINION EXPERIMENTAL STATION, DELHI. **Results of experiments, 1937-45.** By *F. A. Stinson* and *H. F. Murwin.* Delhi, Ontario, 1947. pp. 16. **445**

This report is primarily concerned with tobacco, but there is passing reference to the fact that flue-cured tobacco is sensitive to the effect of the crop grown in the preceding year. Tobacco after corn, soybeans, or timothy sod is frequently light in yield owing to brown rootrot. Late maturity and low grade leaf usually results when flue-cured tobacco follows alfalfa. Sweet clover and red clover add too much nitrogen to the soil. Excellent flue-cured can be obtained after rye which has been sown in the preceding year after sweet clover or red clover hay. The report is primarily concerned with trials on the use of rye as a preceding crop.—R. O. W.

QUEENSLAND. **Report of the Standards Branch for the year 1945-46.** Brisbane, 1946. pp. 4. **446**

The section on seed testing includes reference to the unsuccessful use of blotting paper for germinating garden peas, an attempt to find a satisfactory method of germinating *Paspalum scrobiculatum*, and a variety of ways in which the germination of Rhodes grass (*Chloris gayana*) can be carried out. The use of light and chemicals often accelerates matters when freshly harvested seed of Rhodes grass is being handled.—R. O. W.

FIELD CROP ABSTRACTS

LAND UTILIZATION AND MANAGEMENT

Petterson, G. Vindens skadegörelse på åkerjord i Södra Sverige. [**Wind erosion on arable land in South Sweden.**] *Försök och Forskning* **4.** 92-3. 1947. **447**

In the sandy soil areas of South Sweden 15,000 hectares of arable land, constituting approximately 12.4 per cent of the total land area, suffer injury annually from wind erosion. This occurs mainly during May and June, and causes serious injury to growing crops, especially roots, spring-sown cereals, oil plants and tobacco. The remedial measures necessary involve a change in agricultural management and the planting of protective forests and hedges.

An investigation has been in progress since 1942 at Ugerup State Experiment Station to determine the suitability of different trees and bushes for planting in hedges in the locality. Hawthorn and beam-tree have proved suitable for hedges on land in open cultivation. *Populus trichocarpa* and *P. robustia* are well adapted for planting along property boundaries and in some cases between shifts.—R.P.J.

Nagy, Árpád Ujlaki. Mezögazdaságunk belterjesítése. [**Increasing the intensity of agriculture in Hungary.**] *Agrártudományi Szemle* **1.** 243-52. [English summary, p. 252.] 1947. **448**

Before the war the average acreage of land per capita of those engaged in agriculture was small. Scarcely 1.5 ha. of cultivated land fell per capita to 4.5 million people, and the return was only 345 pengö per annum. It is considered not economic to increase the production area very much. For example, sugar beet occupied 172 thousand ha., i.e. 3 per cent of the whole arable area ; to double this area would be unprofitable because of difficulties in marketing surplus production. On the other hand if crop yields are raised by better soil cultivation and expert management, if more manure were available and greater production of fodder plants and live-stock farming were realized, substantial improvement in standards would be achieved.—M.H.

Kiss, A. A szántóföld felhasználása a földreform utáni elsö (1945-46) gazdasági ébven. [**The usage of arable land in the first year following the Land reform (1945-46).**] *Agrártudományi Szemle* **1.** 343-8. [English summary, pp. 347-8.] 1947. **449**

In the agricultural year 1945-46 the area in cereals increased over that of the previous year, but it reached only 80 per cent of the pre-war area. The area under vegetables, maize and sugar beet was larger than pre-war. The increase in sugar beet and also in sunflower (35 times that of pre-war) is due to a production policy, and the small holdings cannot compete with the difficulties of industrial crop production. The "transforming" effect of the Land reform is not yet determinable.—M.H.

РЯЗАНОВ, Я. Краткий отчет о научно-исследовательской работе Ордена Трудового Красного Знамени Института Зернового Хозяйства Юго-Востока СССР за 1944 год. *Бюлл. Инст. Зерн. Хоз. Ю.-В. СССР.* 1944. *No.* 4, стр. 3-28.

Rjazanov, Ja. [**A short report for 1944 of the Institute of Grain Husbandry of the South-Eastern SSSR.**] *Bjull. Inst. Zern. Hoz. Ju.-V. SSSR.* 1944. No. 4. pp. 3-28. **450**

The Institute has been studying the timing and sequences of tillages, and also other measures which are likely to enable the limited quantities of moisture in the dry south-eastern areas of the USSR to be conserved and efficiently utilized in the production of lucerne, *Agropyron* sp. rye, millet, and other crops. Experiments with lucerne and on *Agropyron* sp. showed that mixtures of these two species dry the soil more and to a greater depth than do other crops, but that the land, after the crop has been ploughed in, accumulates moisture in greater abundance, and this moisture is more efficiently utilized by the succeeding crop, than land ploughed after any other type of crop.

Experiments in the production of lucerne seed on dry land have demonstrated the advantages of reducing the proportion of lucerne in a mixture of lucerne and *Agropyron* seeds for sowing, and sowing the seed mixture in late summer or early autumn. Data were accumulated relating to rates and dates of sowing, the utilization for seed or hay of the successive cuts of lucerne and *Agropyron* nurse crops, and comparisons between various systems of sowing the seeds in alternating rows. The root systems were also studied.—I.Z.

Heyns, O. S. **Dryland lucerne in the South-Eastern Orange Free State.** *Fmg. S. Afr.* **22.** 419-22. 1947. [Extension Officer, Zastron.] **451**

The dryland cultivation of lucerne has proved to be a solution to the serious problem of the deterioration of the grain districts of the Western Cape Province. The soil profited both physically and chemically and there was a higher yield obtained from cereals following a lucerne. The stimulating effect of the crop on the soil also lasted longer than that of fertilizer. It can also be cultivated very successfully under dryland conditions in the Orange Free State and therefore offers a solution to the threatening problem of soil exhaustion and deterioration since the Orange Free State is a grass area with no indigenous clover of any kind. The soil contains no nitrogen-fixing bacteria. The lucerne seed must therefore be inoculated before-hand with the necessary nodule-forming bacteria.—G.M.H.

HAREN, C. C. **The Nation's land resources.** *Agric. Situation* **31.** 11-2. 1947. **452**

About 60 per cent of the land of continental U.S.A. is under farm ownership or lease. This includes 451 million acres in cropland, 481 million acres in pasture besides cropland or woodland pastured and 166 million acres of farm woodland. More than one-half of the land area is thus used or available for pasture, all classes of pasture in farms and ranches amounting to 624 million acres. Non-forested grazing land outside farms amounts to 178 million acres, mostly of native grasses and shrubs, and in public ownership. Approximately 250 million acres of more open and accessible forest lands are also used for grazing purposes.

Less than one-fifth of the nation's land area provides, directly as foodstuffs or fibres, or indirectly as feed and forage for live stock, most of the agricultural products which go to meet its needs. The acreage from which crops have been harvested in recent years represents about 2.5 acres per capita. Two-thirds of the acreage of crops harvested goes to provide feed for live stock ; one-fifth of the acreage is used for growing wheat, rice and other crops which are staples in the diet and about one-tenth of the acreage is under fibre, oil-producing and other crops.

Changes in consumers food habits during the past three decades have increased the value of the potential pasture resources, but pasture improvement, despite gains obtained in recent years remains an important but largely undeveloped field. The 159 million acres added since 1930 to the pasture acreage, represent only minor gains to acreage not previously grazed. Shifts since 1930 from crops to pastures on the hilly and erosive land extending from southern Iowa to eastern Texas have offset losses during the 1920 period of farm abandonment in the eastern state.—P.M.

BEAR, F. E. **Soil conservation and good land use.** *Soil Sci.* **64.** 255. 1947. **453**

This special number presents an over-all picture of the problems and processes in soil conservation and good land use. Dr. H. H. Bennett, Chief of the Soil Conservation Service of the USDA, reviews the development of the national programme of soil conservation, and this is followed by a series of papers from the seven regional conservators, in which special regional problems are considered.—P.M.

WYLIE, Kathryn H. **Food production and supply in Mexico.** *Foreign Agric.* **11.** 106-12. 1947 **454**

Zea mays is the principal food-stuff in Mexico, occupying approximately one half the acreage in crops. Other important crops are sugar, beans, rice and wheat. Information is supplied on yields and acreages of all these crops for the period 1935-9 and 1941-7. Cattle are the most important animals produced, but there are relatively few dairy farms, most of the animals being used for the dual purpose of meat and milk. —M.H.

PELZER, K. J. **Agriculture in the Truk Islands.** *Foreign Agric.* **11.** 74-81. 1947. **455**

The islands are located 7°N. of the equator and have a tropical oceanic climate. Most of the original forest cover has been destroyed as a result of native agriculture. Patches of land are used intermittently for the raising of annual crops but when the patches are not in cultivation they become covered with tall grasses, especially *Paspalum conjugatum*, or with weedy shrubs and small trees such as *Hibiscus*, *Acalypha*, and *Macaranga*. There is discussion of the agricultural economy of the islands, and of the effect on it of war conditions. —M.H.

CROPS AND CROP PRODUCTION

KNUTSSON, G. Olje- och spånadvsäxter i Uppsala län. [**Oil and fibre crops in the province of Uppsala.**] *Sverig. Utsädesför. Tidskr.* **57.** 197-9. 1947. **456**

Although fibre flax and hemp are the most important of the cash crops, during recent years white mustard and poppy have been cultivated in the province with varying success.

In 1943 the area devoted to fibre flax was 96 ha. ; in the current year it is more than 250 ha. Soils which according to trials and analysis show a relatively satisfactory potash condition nevertheless require an application of potash for flax cultivation. Flax appears to be unexacting as regards phosphoric acid.

The control of weeds is a difficult problem Sodium chlorate applied in the autumn to combat root weeds has proved to exert a harmful effect on fibre quality of flax. Hoeing and weed harrowing frequently promote seed setting but as a rule have a less favourable effect on fibre development Spraying against seed weeds has been carried out with good results. Hitherto sulphuric acid has been mainly used. Experience up to the present indicates that hormone preparations have an unfavourable effect on fibre development. In harvesting, drying on poles is becoming increasingly general ; this method is preferable to hurdling.

The hemp area in the province since 1942 has amounted each year to some 150 ha. Too high a ground water table and a deficiency of nutrients are the factors which have contributed primarily to uneven yield results in a number of cases. Statistics indicate that both hectare yield and quality have improved greatly each year.—R.P.J.

HOVD, A. Avlingsstorleiken på myrjord og fastmark under ymse vertilhøve. Ei statistisk gransking gjennom 20 år. [**Size of yields on peat soil and mineral soil under different weather conditions. A statistical investigation covering 20 years.**] *Medd. norske Myrselskap* **45.** 109-21. 1947. **457**

The yields of hay (1 to 3-year leys) and of barley, oats and turnips at Mære Agricultural School and at Mæresmyra Experiment Station during the period 1922-1941 are reported and discussed.

Well humified, good peat soil requires as much warmth as possible under the conditions of growth at the centres specified, especially for the cultivation of cereal crops to be harvested ripe, and also to obtain good yields of roots. Injury from drought does not occur at all, or only to a very slight extent. Cereal crops give poorer results on peat soil in cold, wet and late years, owing to lodging, late ripening, and, frequently, night frosts.

On well-manured and good mineral soils the best yields are obtained in medium-warm and humid years. This applies to cereals and roots. Barley and particularly oats give good yields also in cool years.—R.P.J.

HALLGREN, G. **Studies on the influence of precipitation on crop yields in Sweden with special reference to field irrigation.** *Kungl. LantbrHögsk. Ann.* **14.** 173-289. 1947. **458**

In order to determine for what crops and areas of Sweden irrigation could be used advantageously, a study of the relationship between precipitation and crop yields was carried out. Nine farm schools in different parts of Sweden supplied data of yields covering a period of 40 years and including such crops as cereals, potatoes, root crops, clover and grass leys.

The dominating factor in the case of spring seeded grains was precipitation during May and June ; barley required an optimum precipitation of 100-110 mm. during these months, and oats, approximately 100-120 mm. during the same period. Root crops on farms in southern Sweden showed a marked relationship between yield and the May and June rainfall ; on the other hand variations in July and August precipitation had no appreciable effect on yields. For the root crops, the calculated optimum precipitation proved to come close to the average precipitation. Autumn seeded grains were more affected by temperature than precipitation, especially from January to April.

The relationship between irrigation and precipitation was determined, and it was noted that the effect of irrigation was 40-50 per cent of the effect of precipitation. (See *Herb. Abstr.* 18. Abst. 387.—P.M.

BOERMAN, W. E. Klimaat en wereldvoedselproductie. [**Climate and world food production.**] *Landbouwk. Tijdschr.* **59.** 429-34. 1947. **459**

A general consideration of the subject was presented in an address delivered to the 12th Netherlands Agricultural Congress in July, 1947. An exposition was given of Köppen's classification of climates, and findings of the American geographer Huntingdon were cited [references not given] and the value of his climograph noted, all as applied to the possibility of growing crop plants in given regions. Plants considered were rice, maize, oats, barley, wheat, potatoes, and oil plants including soybeans.—G.M.R.

КУЗЬМИН, В. П. Опыт отбора сортов для Акмолинской степи. *Селек. Семеновод.* 1946. *No.* 4-5. стр. 25-34.

KUZJMIN, V. P. [**Selection of varieties for the Akmolinsk steppe.**] *Selek. Semenovod.* 1946. No. 4-5. pp. 25-34. [Šortandinsk Agric. Expt. Sta.] **460**

The work of this Station has been in progress since 1935, and concerns an area of feather-grass (*Stipa* sp.) steppe in north Kazahstan on the boundary of the southern black soil and dark chestnut soil regions. In spite of the modern advance in agrotechnical methods, the level of such methods in this locality has remained low, primarily because of the sparse population. Further, crop yields fluctuate greatly, depending on the climate. For example, from the spring wheat variety most suitable for the region (Milturum 321), during 11 years yields varied from 5-6 to 28-9 centners per ha. Field crops are required which are resistant to heat, cold, drought, floods and strong winds ; also they must be resistant to these factors at their different growth phases. Such plants have been termed climatically hardy varieties. The frost-free period during the year is on an average only 98 days, with fluctuations between 63 to 142 days. There is thus need for varieties which are not only hardy, but have high adaptability to sudden changes in climatic conditions and have the character of an " opportunist."

Details are supplied of (1) the behaviour under varying conditions of different wheat varieties, notably Milturum 321 and Akmolinka 1 ; (2) the millet variety Zarja (from a cross between fodder proso and a local branched, early ripening type), for the Akmolinsk area where the need is for a variety with compact, erect panicles to withstand the force of the wind ; (3) Kazahša, a variety of *Fagopyrum* which yields an average of 9.7 centners per ha. with fluctuations from 4 to 32 centners per ha. ; (4) early and late flowering types of *Pisum* sp.; (5) a fodder *Cicer* selected from Czechoslovakia ; (6) lucerne tests which show that shallow-rooted wild yellow lucerne is better than blue lucerne ; the work on lucerne has been started only recently but includes selection for high seed production from the north Caucasian ecotype ; and (7) the winter rye variety Zima, promising for the region concerned according to data obtained during 1941-5.—M.H.

МОСОЛОВ, В. П. и КРАЛИН, П. И. Борьба с гибелью озимых культур. Москва, 1940. стр. 17.

MOSOLOV, V. P., and KRALIN, P. I. [**Control of damage to winter crops.**] Moscow, 1940. pp. 17. **461**

Winter crops occupy about 30 per cent of the sown area in USSR. Yields are sometimes not as high as anticipated, owing to various causes, and agronomic measures to improve production are therefore recorded specifically for crops in the north and central regions, for those in the south, the south-east and the eastern regions of the Union. Problems of agrometeorology are outlined and measures for co-ordinating them with data obtained from crop yield studies are put forward.—M.H.

ШАРАПОВ, Н. И. Климат и географическое районирование сельскохозяйственных культур. *Изв. Всесоюз. Географ. Общества* Том 79. *No.* 4. стр. 439-46. 1947.

ŠARAPOV, N. I. [**Climate and geographical regions of crop production.**] *Izv. Vsesojuz. Geograf. Obščestva* **79.** 439-46. 1948. **462**

A study of the geographical regions most suitable for cultivation of various crops (whether grown for protein, oil, starch, fibre, sugar, etc.) is of vital importance to any country, and especially so for the USSR, with its vast territory. Following brief notes on the regions in USSR in which cotton, sunflower, and rye are grown, the author deals more fully with wheat production. In 1865 Ljaskovskiĭ recorded that Russian wheat had a prominent place in the world market because of its protein quality and this characteristic is attributed to the influence of climatic factors (continental) in USSR, which factors are in contrast to those of western Europe. It is claimed that for a satisfactory protein content in wheat there are only two main centres : (1) USSR, the south-east, Ciscauscasia, Ukraine steppe (spring wheat), north Kazahstan, West Siberia, and parts of eastern Siberia (protein content of grain=17 to 19 per cent, and sometimes 24.6 per cent) ; (2) the spring wheat and flinty winter wheat areas of North America. In USSR the dryness of the air at the most responsive phase of plant growth is said to be the chief factor in successful wheat production in the black-soil areas. Reference is also made to the extended sowings of sugar beet in USSR. During the 1914-18 war this crop was grown chiefly in central Europe, and in Russia only in the Ukraine. There is need in the new regions (Kirgiz, Kazahstan, and Uzbekistan, among others) to study methods of production and management.

Consideration is given to the concept that plants are divisible into two groups according to the predominance, resulting from their metabolic processes, of either carbohydrates or proteins. The effect on such processes of climatic factors (especially availability of moisture in temperate, cold and warm regions) is discussed with special reference to the reserve products in the plant. For example, under an efficient supply of moisture, large quantities of carbohydrates are synthesized in the plant, but with deficient moisture, the protein complex predominates. Observations on certain crops are discussed in the light of this hypothesis and in the light of planning the future of agriculture in USSR.—M.H.

РЯЗАНОВ, Я. И. План научно-исследовательской работы Института Зернового Хозяйства Юго-Востока СССР за 1946-1950 годы. *Соц. Зерн. Хоз.* 1946. *No.* 4. стр. 57-69.

RJAZANOV, Ja. [**Scientific research schemes of the Institute of Grain Husbandry, South East SSSR. for the years 1946-50.**] *Soc. Zern. Hoz.* 1946. No. 4. pp. 57-69. **463**

See also *Herb. Abstr.* 17, Abs. 996. The work is to be extended with special reference to : herbage rotations ; effect of climatic conditions which are peculiar to the south-east ; measures for control of weeds, diseases and pests ; improvement of agronomic measures to increase yields of spring wheat and other important field crops (millets, sunflower); plant selection and improvement ; and protective measures (including irrigation) necessary for crops in arid regions.—M.H.

SANTIAGO DE LAS VEGAS, Estación Experimental Agronómica Cont. No. 1. Observaciones sobre el rocío en la zona tropical. [**Observations on dew in the tropics.**] By *A. Bonazzi* and *A. Herrera*. 1947. pp. 6. **464**

The Contribution comprises a Spanish translation by *L. C. Scaramuzza* of an article which appeared originally in Italian in *Agric. colon.* 27. 563-9. 1933. It describes studies made in Cuba

Dew was collected nightly on coarse-meshed fustian placed (a) under cheese cloth and (b) in the open air, and weighed. The records of mean daily dewfall for each of the 12 months April 1931 to March 1932 are presented, together with data on the mean, maximum and minimum temperatures, and rainfall in the same months. On another occasion, water condensation was studied, (i) at sunset and (ii) between 15 min. to 2.5 hours later, on the plants of a sown herbage ley. Ten areas were concerned, six being uncovered, three under trees, and of one the grass was cut but left *in situ* in its original vertical position. Soil temperature (10-15 cm. deep) and temperature of the air (12-15 cm. above the surface of the ground) are recorded. Condensation at sunset was everywhere *nil*; later (15 min. and onwards), it was everywhere abundant except under the trees and in the cut grass, where it was *nil*. The varying distribution of the water on the leaves of the different species is noted.

The conclusions reached are that not all the water which accumulates on plants between sunset and sunrise is attributable to dew, but an undetermined part is due, in a tropical climate, to active exudation by the plant, coinciding with a thermometrical scale which descends from the ground upwards to the leaves. The amount of dew is in inverse ratio to the rainfall. The use of cheese cloth, as in tobacco growing in Cuba, eliminates approximately 50 per cent of the dew. The importance of the covering (the cheese cloth over the tobacco, for example, or the cloth under which Bruner grew *Phaseolus lunatus*, *Informe An. Est. Agr. Santiago de las Vegas*, 1930-31) may be connected with the poorer development, as a result of reduced condensation under the cover, of the fungi which attack crop plants.—G.M.R.

ECONOMICS OF CROP PRODUCTION

ŤUKAL, J. Výrobní výlohy obilovin v řepařských podnicích. [**Grain production costs on beet-growing farms.**] *Sborn. čes. akad. Zeměd.* **14.** 108-15. [German summary, p. 115.] 1939. **465**

The production costs of grain per ha. are calculated for Czechoslovakian farms of the size group 2-50 ha., where 58.58 per cent of cultivated land is used for grain production. The production costs for wheat, rye, barley and oats and their distribution in agricultural book-keeping are given in tables. Irrespective of crops (a very variable factor, which distorts calculation results of production costs), this method has certain advantages when comparing the mutual relation of grain. The average production costs of grain per ha. decrease with the increase of acreage.—K.A.A.

BAPTIST, G., DERWAEL, F., and BOCKSTAELE, L. Opzoekingen aangaande de rendabiliteit van de landbouw. [**Investigations relating to the profitability of agriculture.**] *Med. LandbHoogesch. Gent* **12.** 235-97. [French and English summaries, pp. 295-7.] 1947. [Rijksstation v. Landbouweconomie, Ghent, Belgium] **466**

An economic study of 118 Belgian farms for the year 1946-47. The ratio of grassland to arable land was 1.00/1.72. The percentage contributed to the total gross yield by animal husbandry was 56.10, by crop growing 40.73.—G.M.R.

LOM, F. Vztah mezi produktivtou a katastrálními výnosy v bývalé zemi Moravskoslezské. [**The relation between productivity and yield as assessed in the land register of former Moravia-Silesia.**] *Sborn. čes. akad. Zeměd.* **14.** 103-8. [German summary, pp. 107-8.] 1939. [Received 1947] **467**

The importance of the land register in agriculture is indicated. Together with the ground rent book it forms the basis for correct taxation and assessment of farm land. The last revision of the land register and ground rent book was made in 1909 and the data do not represent factual productivity.

Assuming that net yield is in direct proportion to productivity, the yield of the four main cereals per ha. when averaged through 2 decades is taken as unit of productivity (1894-1903 and 1924-1933) and compared with the average assessment as booked in the land register. The author follows the relation between yields per ha. of grassland and gardens to those of ploughed land. (Yield of 1 ha. of ploughed land=100 per cent).

The results are summarised as follows. The lowest yields per ha. are in the fodder areas and the highest in the sugar-beet districts. If the districts are arranged according to increase in yields, then it becomes evident that the fodder producing districts are as much as 40 per cent below the average yield per ha. through both decades, while the sugar-beet areas are 20-30 per cent above the average. The yields as assessed in the land register show the same tendency, but there is greater irregularity.

The deviations of the net yield and the yield as assessed in the land register from the average yield in the production areas are much larger than those of the monetary value of the gross yield and the yield of cereals per ha. during both decades.

A revision and correction of the assessments in the land register is therefore necessary. There is convincing evidence that the yield of pastures in the majority of districts is assessed much higher in the land register than in that of fields, though it should be lower. The reason for this anomaly is that the gross yield from grassland has been assessed on the basis of market prices of hay which are much higher than the employable value of hay used for stock raising.

The author concludes that in future, assessment should be made in all parts at the same time, to avoid the influence of periodic fluctuations, and that data should also be taken from agricultural book keeping.—K.A.A.

JUHÁSZ, L. Gondolatok mezögazdasági külforgalmunkról. [**The outlet for Hungarian surplus products**] *Agrártudományi Szemle* **1.** 253-62. [English summary, p. 62.] 1947. **468**

Between the two world wars, large quantities of farm products, exported mostly at ruinously low prices, did not promote intensive methods of farming. Certain procedures in times past (bilateral commercial treaties, and preferential agreements) seem to be even less promising at present than they were before. Instead there should be further co-operation of complementary economic areas. If inevitable obstacles frustrated this readjustment attempts should be made to organize the federation of agrarian countries exporting their surplus products on a collective basis instead of practising ruthless competition. In this case most exportable categories of agricultural commodities would show an improvement both in quantity and value as a result of co-ordinated negotiations with importing countries offering agricultural commodities only in such quantities and succession as can be sold at prices covering the farmers' cost of production. The total agricultural surplus in this part of Europe corresponds to a fraction only of the total demand of the continent. From this point of view Hungarian agricultural export after the second world-war begins under rather promising auspices.—From Authors' summary.

BAKOSS, L. A magyar szövetkezeti hálózat újjászervezése. [**Co-operative organization in the new order of production.**] *Agrártudományi Szemle* **1.** 348-59. [English summary, pp. 358-9.] 1947. **469**

Henceforth it will be the task of small holders, beside securing supplies for inland need, to produce a surplus of agricultural products for export also, and to market this surplus in a more orderly fashion. In order to bring about better adjustment between the customers' requirement and the dispersed production and marketing, well organized guidance of small farming is indispensable. Success of socially guided farming can be assured on a co-operative basis only. Therefore the line of each co-operative sector must be layed down in advance. The Minister for Co-operative Affairs, in collaboration with other competent departments of the Government, shall decide upon the first principles of co-operative economy and education and on aims and means of co-operative propaganda. The Co-operative Centre of Farmers shall guide and control the organizations.—From Author's summary.

ÚJLAKI, N. A. Miért szükséges a mezögazdaság termelés irányítása? [**The need for direction i Hungarian agricultural production.**] *Agrártu dományi Szemle* **1.** 84-7. [English summary p. 87.] 1947. **47**

The need for authorative direction of the wor on the small holdings created by the Land reform i necessary to ensure sufficient grain crops and t avoid a deficiency in those products on the large farms and estates. The value of these crops only one-third of the Hungarian export in the past —M.H.

KULIN, S. Dunántúli parasztgazdaságok a szám tartásstatisztika tükrében. [**Trans-Danubia peasant holdings in the light of farm accountanc statistics.**] *Agrártudományi Szemle* **1.** 169-80 [English summary, pp. 179-80.] 1947. **47**

The following are among the findings reported the diminished size of farm holdings leads t an increase in returns per acre; the product marketed from small holdings do not includ cereals for bread or maize, and therefore there need for reorganization in regard to these products the farmer needs to develop intensive farming an growing of special crops in order to utilize hi family's working capacity; to achieve successfu farming in small holdings, there is need for Govern ment action in regard to adjusting prices of pro ducts, producing implements, developing market ing co-operatives, and raising the cultural stand dard of small holders.—M.H.

MACHINERY AND EQUIPMENT

LONDON, The British Electrical and Allied Indus tries Research Association. Tech. Rep. Re W/T9. **The electrification of Highland agricul ture.** By *C. A. Cameron Brown.* 28× 21. 35 London. 1945. 3s. **47**

An account of a short investigation carried ou to determine to what extent the affording of ele tricity supplies to the area of the North of Scotlan Hydro-Electric Board, would call for new or mod fied researches to meet any special problems raise in the electrification of Highland farms. Particula attention has been paid to crop drying in its variou forms, which is an outstanding need in the Hig lands, to improving the standard of milk produ tion and to simplifying the working of the far buildings.—From Author's summary.

LONDON, H. M. STATIONERY OFFICE. British I telligence Objectives Sub-Committee. Final Re No. 1257. **Agricultural engineering in the B tish zone of Germany 1946.** London, 1946. **47**

A number of agricultural engineering firm were visited, with the object of investigating a implements or methods of working which were n epresented in current British practice. The pportunity was taken to discuss such questions as he organisation of research and the training of gricultural engineers. The investigations yielded o very startling results, but the details recorded hould be of interest to specialists in the particular ubjects. The general trend in design is towards ghter construction and machines which are impler to operate and to construct. The report is lustrated with photographs and diagrams, and a omplete list of the firms visited is given as an ppendix.—P.M.

КОВЛЕВ, А. Г. Как ускорить работу зерносушилки ВИСХОМ. *Селек. Семеновод.* 1946. *No.* 4-5. стр. 73.

AKOVLEV, A. G. [**How to accelerate the work of the V.I.S.H.O.M. grain drier.**] *Selek. Semonovod.* 1946. No. 4-5. p. 73. **474**

The fan of the grain drier becomes clogged with ust, the current of air being thus diminished. The imple device here described is a visual indicator f the progress of such clogging. It consists of a U-tube partly filled with paraffin. By means of a ubber piping one arm of this tube is connected with the drier at a point from which the fan draws ir. The levels of the paraffin in the two arms are qual when the fan is stationary, but that in the rm connected with the drier rises when the fan is working. The amount of rise is a guide to the rate f the air current through the fan, and how much bstruction by dust is being caused.—I.Z.

BATES, G. **Two novel agricultural implements.** *Qd. agric. J.* **64.** 325-8. 1947. **475**

The implements described and illustrated are a " scratcher " for weeding young plants and ratoon ones of *Saccharum officinarum* and a " scarifier " or inter-row cultivation. When used together hey have reduced hoe work and other labour to a minimum.—M.E.E.

SEEDS

MATHLEIN, R. Lagringsskador på spannmål. [**Storage injuries in grain.**] *Försök och Forskning* **4.** 105-8. 1947. **476**

To prevent mould injuries the moisture content of the grain should be as low as possible, warehouses should be dry and well ventilated, and the premises should be appropriately aired (preferable only in dry and cool weather).

In Scania and adjacent provinces *Calandra granaria* causes injury to stored grain, but owing to its susceptibility to cold it is not so serious a pest in Sweden as it is in Denmark, where the annual losses caused by it are estimated to amount to 10 million kronor. Dusting with a DDT preparation at the rate of 1 kg. per ton of grain destroys the pest. *Tinea infimella* is a very common pest in grain in Sweden. The overwintering larval generation is practically inaccessible to control. Recently excellent results in combating the pest have been obtained with some types of DDT preparations when treatment has been carried out in the spring or early summer. Mites thrive in grain with a moisture content of approximately 16 per cent. They cannot develop when this figure is reduced to below 15 per cent.

It is estimated that in Sweden rats and mice cause damage amounting annually to 100 million kronor and that injury to grain is responsible for a great part of the loss. Action should be taken against these pests particularly in country districts.—R.P.J.

HAGUE (The), The Board for the Plant Breeder's Right. **Plant Breeder's Decree 1941. The legal status of the plant breeder and the trade in propagation material in the Netherlands.** 1946. pp. 18. **477**

The Decree comprises the following parts: I. Definitions ; II. The Central Register of Varieties, the plant breeder's right, its duration of validity, transfer, and dispossession, and provisions regarding procedure ; III. Lists of varieties, and special provisions regarding cultivated plants which are of particular value to agriculture ; IV. Inspection services ; V. Penalty clauses ; VI. Temporary, executive and final provisions. [See also *Herb. Abstr.* 17. Abs. 1698. 1947.]—G.M.R.

HAAN, H. de. Plantenveredeling. [**Plant breeding.**] *Cultivator* 1946. pp. 6. [English summary, pp. 4.] [Inst. Plantenveredeling, Wageningen] **478**

A short account of some of the chief achievements of plant breeding, and of the measures taken in the Netherlands to control the release and sale of varieties and to protect the breeder. [See also *Herb. Abstr.* 17. Abs. 1698.]—G.M.R.

ГОГОЛЕВ, Ф. Т. Значение толщины слоя зерна при его естественной подсушке в зернохранилищах и под навесами. *Селек. Семенов.* 1946. *No.* 7-8. стр. 73-4.

GOGOLEV, F. T. [**The depth of a grain layer in relation to the air-drying of grain in storage and under shelters.**] *Selek. Semenovod.* 1946. No. 7-8. pp. 73-4. **479**

The initial moisture content of the grain and the humidity of the atmosphere having been determined, it was found by experiment that the rate at which the moisture content of the grain reached a state of equilibrium, assuming a value somewhere between the first two, was fast or slow according as the layer in which the grain was spread was shallow or deep. In a shallow layer of 3 or 4 cm., the equilibrium was soon reached even during damp weather.—I.Z.

АЛОВ, А. С. Насыщение семян удобрениями. [Смотри] *ВНИИСП, Научный Отчёт*, 1941-42. стр. 50-64. Москва, 1945.

Alov, A. S. [**Saturating seed with fertilizers.**] [Contained in] *VNIISP, Nauč. Otčët*, 1941-42. pp. 50-64. Moscow, 1945. **480**

An increase of N nutrition for seed improves the energy of the plants' early growth as well as the total plant mass in the first stage of development. One means of increasing nitrogen in the seed is by soaking seed in solutions of nitrogenous fertilizers. The effectiveness of such soaking depends, of course, on the type of fertilizer, its concentration, reaction of the solution, and duration of soaking. With increased concentration of the solution the effectiveness of soaking is diminished. Some acidity of the solutions (more for beet, less for wheat) is removed by the energy of seed germination. Soaking beet seed in solutions is more effective after a preliminary stimulation of the seed by gradual steeping in a small amount of water. Culture solutions including N have great influence (in direction and intensity) on all physiological processes within the germinating seed.—M.H.

DISEASES AND PESTS

Thung, T. H. De verspreidingswijze van plantenziekten. [**The manner in which plant diseases spread.**] *Landbouwk. Tijdschr.* **59.** 346-50. 1947. **481**

A detailed discussion is presented of the extent to which plant diseases can be and are spread by insects as the vectors of viruses and by the spores of fungi. Insects and spores are borne by (a) wind (small insects and spores have been found as high as 14,000 ft. above the ground), (b) watercourses, (c) persons, and (d) commercial transport.—G.M.R.

Klemm, M. Beitrag zur Pflanzenschutzstatistik. [**Contribution to the statistics of plant protection.**] *Festschrift Otto Appel* 1947. 23-6. [Biolog. Zentralanst. Land- u. Forstwirtschaft, Berlin-Dahlem] **482**

The value of the statistical evaluation of records of plant disease and injury is illustrated by the consideration of some records made over a period of years by the German Plant Protection Service. They are concerned among other things with loss caused to clover sowings by field mice, *Sclerotinia trifoliorum*, and winter killing respectively (1901 to 1936) and with black rust of wheat in eastern Germany in 1932.—G.M.R.

Klinkowski, M., and Richter, H. Untersuchungen über den Wirtspflanzenkreis von *Colletotrichum trifolii* Bain et Essary. [**Investigations concerning the hosts of** *Colletotrichum trifolii* **Bain et Essary.**] *Festschrift Otto Appel* 1947. 56-8. **483**

Colletotrichum trifolii, a fungus which causes anthracnose, was first discovered (1906) in the U.S.A. and has since been found in South Africa and Europe. Its geographical distribution, so far as yet known, is outlined. The principal host is, in the U.S.A. *Trifolium pratense*, in Europe *Ornithopus sativus*, *Medicago sativa* in both cases taking the second place. No damage of economic importance to other cultivated plants is yet known. Hitherto the list of hosts has been restricted to representatives of the genera *Medicago*, *Trifolium*, *Melilotus* and *Ornithopus*; but inoculation trials and observations in the open now show that species of *Lupinus*, *Trigonella*, *Hosackia*, *Anthyllis*, *Lotus*, *Galega*, *Coronilla*, *Onobrychis*, *Vicia*, *Cicer*, *Lens* and *Lathyrus* are attacked by the fungus. When a large number of species of a genus are tested, resistant species are generally found. For example, among 11 species of *Vicia*, *V. angustifolia* always proved resistant, although the closely allied *V. sativa* was always susceptible.—G.M.R.

Hey, A. Gegenwartsprobleme der Pflanzenhygiene. [**Present problems of plant hygiene.**] *NachrBl. dtsch. PflSchutzdnst* N.S. **1.** 44-7. 1947. [Biol. Zentralanst. Land- u. Forstwirtschaft, Berlin-Dahlem] **484**

In an address delivered to the Plant Protection Section of the German Agricultural Society in February, 1947, special attention is paid to measures preventive of plant disease, in which the importance of suitable cropping systems, choice of variety, and the use of home-grown seed is stressed. There is also mentioned the desirability of studying the growing of plants together in different combinations for their effect one upon the other and upon predisposition to disease.—G.M.R.

WEEDS

Sweden, Royal Agricultural College, Institute of Plant Husbandry. (Crop Production) 2. Försök rörande Kampen mot ogräset. 1935-1946. [**Weed control experiments.**] By several authors. 1947. pp. 318. **485**

At the Royal Agricultural College at Uppsala weed control is part of the subject of Plant Husbandry. Research in weeds and weed control have been carried on at the Institute of Plant Husbandry since 1934, and from 1941 this research was concentrated on annual weeds. The papers in this volume form a comprehensive report of the investigations and include preliminary results obtained in 1946 with the new hormone weed killers. English summaries appear with each paper.—P.M.

SWEDEN, Uppsala läns Hushållningssällskaps Försökskommitté Medd. No. 5. Hormonderivat mot ogräs. [**Hormone derivatives in the control of weeds.**] By *E. Åberg*. 1947. pp. 16. **486**

Spraying with hormone derivatives is recommended primarily for cereal crops, with the exception of barley. They should not be employed for cereal crops undersown with grassland legumes, fibre flax, rape, mustard and root crops.—R.P.J.

ÅSLANDER, A. Klorat mot åkerogräs. [**Chlorate to combat weeds on arable land.**] *Jordbruk. ForenBl.* **17.** 5. 1947. **487**

In Sweden the autumn of 1946 and the following winter were highly unsuitable for the chlorate method. The most serious injury to spring-sown cereals was reported from South Sweden.

In using chlorate the following rules should be followed : the chlorate should be spread as soon as possible after harvesting of the crop, preferably before the middle of September ; immediately after spreading it should be ploughed in to full depth ; the amount applied should not exceed 200 kg. per ha. ; the weeds to be eradicated by chlorate at this time of the year are deep-rooted, such as *Cirsium arvense* and *Tussilago faxfara* ; for the control of more shallow-rooted weeds, such as *Triticum repens* and *Sonchus oleraceus*, the chlorate should be spread in the middle of July and ploughed in late in the autumn ; on badly drained land chlorate should not be used, and on soils not readily permeable the dose should be restricted to 150 kg. per ha. Testing of the method on a small area should always precede its application on a large scale.—R.P.J.

DENMARK, Statens Forsøgsvirksomhed i Plantekultur. Medd. 392. Nye kemiske Midler til Bekæmpelse af Ukrudt i Landbruget. [**New chemicals for combating weeds in agriculture.**] 1947. pp. 4. **488**

Results of experiments with growth hormone preparations are reported. Care must be exercised in their use to control weeds in cereal crops. They should not be employed before the grain has germinated, as germination may be seriously checked if treatment is carried out immediately before or after sowing. The germination-repressing effect persists in the soil for approximately 2 months.—R.P.J.

von HOFSTEN, C. G. Ogräskampen. [**Weed control.**] *Lantm. Svenskt Land* **31.** 806. 1947. **489**

The presence of wild oat (*Avena fatua*) has been reported from six localities in Scania. In three cases the main form occurred and in the remaining three f. *glabrata* Peterm. Osvald (1947) reports the occurrence of *Galinsoga parviflora* as a weed on a Scanian farm.—R.P.J.

FASSETT, N. C. *Rumex* **and** *Polygonum* **in Colombia.** *Caldasia* **4.** 215-27. 1946. [Dept. Botany, Univ. Wisconsin, U.S.A.] **490**

A phytogeographical and taxonomical consideration. *Rumex tolimensis* is a native species, endemic in the páramos of central Colombia. The other spp. of *Rumex* are adventive and found along roadsides, in waste land, pastured ground etc.—G.M.R.

CEREALS

SURÁNYI, J. Adatok Magyarország kenyérgabonaszükségletéröl. [**Data on food-grain requirement in Hungary.**] *Agrártudományi Szemle* **1.** 87-8. [English summary, p. 89.] 1947. **491**

During 1929 to 1938 the yield of wheat and rye in Hungary averaged 2,906,500 tons. Home consumption in wheat and rye (including seed) is about 2,216,000 tons. The change in economic conditions induced by the Land reform is expected to effect a reduction of 25 to 30 per cent in such yields. Further, if straw is deficient the farmer cannot obtain manure in sufficient quantity to maintain soil fertility. Under pre-war conditions at the best only 60 per cent of the straw requirement was grown in Hungary.—M.H.

ECHEVERT, M. P. Selección del maíz para semilla. [**Selecting maize for seed.**] *Ager* **3.** 164-8. 1947. [Nat. Agric. Service, Spain] **492**

The types of maize (*Zea mays*) grown in the Iberian peninsula are intermediate between flint and dent. That grown in the province of Seville is the most important. It is a semi-flint type, and although " not one of the worst " it has greatly degenerated, especially as regards ratio of grain to cob. Cultural technique in the province is admirable, yields of over 1500 kg. per hectare having been recorded, and in view of this and of the fact that a good maize cob can produce 500 to 1000 plants, the importance of selecting for better seed than that actually employed is evident. The author outlines the ideal characters of a good general purpose maize plant and the ideal characters and proportions of a good cob for seed and of seed for sowing. Methods of preliminary selection in the field for earliness, general plant character etc., and of final selection for cob character are described, the importance of field selection being stressed. Methods of testing germination capacity are also described. Finally a short general description is given of cultivated maize, its cultivation, storage, uses, place in the cropping system, and its diseases and pests.—G.M.R.

TORBÁGYI-NOVÁK, I. Az édescirok ipari értéke. [**The industrial value of sorgo.**] *Agrártudományi Szemle* **1.** 120-6. [English summary, p. 126.] 1947. **493**

In Hungary the cultivation of *Sorghum* sp.

took a forward step in 1939. Remarkable results were achieved when research was carried out for sugar substitutes during the war. The crop now yields 350 to 430 quintals of the green parts, or 210 to 260 q. of stalk without leaves per hectare. This drought-resistant plant is free from disease in Hungary.

From its stalks a juice containing 16 to 18 per cent of sugar can be pressed, i.e. 105 quintals per hectare; yielding 1220 to 1300 litres of alcohol. The pressed stalks are used as fodder. Yield is 14 quintals per hectare, i.e. 7 quintals of husked grain called "C" rice (which is used as a substitute for rice, at present available only in small quantities). The bran is used as fodder.—M.H.

SWEDEN, Uppsala läns Hushållningsällskaps Försökskommitté. Medd. No. 5. Såtidsförsök med höstsäd vid Lantbrukshögskolan 1935-1945. [**Date of sowing trials with autumn-sown cereals at the College of Agriculture, 1936-1945.**] By *E. Åberg*, and *F. Fajersson*. 1947. pp. 16. **494**

The results now reported and previous experience indicate that for Middle Sweden the most suitable time for sowing is during the first two weeks of September. When the autumn is mild and winter sets in late, some injury by diseases and insects is to be expected, but this is generally less severe in practical agriculture than in small plots. —R.P.J..

KERLE, W. D. **Pop corn.** *Agric. Gaz. N.S.W.* **58.** 250-1. 1947. **495**

Pop corn varieties of *Zea mays* can be grown on any type of soil suited to ordinary maize, but sandy loams are most favourable for production. Either drill sowing in rows 3 to 5 ft. apart or sowing in hills 3 ft. apart each way may be employed, the quantity of seed required varying from 3 to 5 lb. per acre according to variety. White rice is the only variety grown to any extent in New South Wales. Harvesting is begun after the pop corn is thoroughly mature on the stalk, and bagging is carried out when the moisture content is below 14 per cent in order to preserve the popping quality of the grain.—M.E.E.

MISSOURI Agricultural Experiment Station. Bull. 501. **Growing good crops of oats in Missouri.** By *J. M. Poehlman*. [Revision of Bull. 439] 1947. pp. 18. **496**

Early sowing and the choice of suitable varieties of *Avena sativa* are stressed. Recently developed varieties, particularly Boone, are stiff-strawed, good yielders and resistant to rusts and smuts, but they are not so early as older varieties such as Columbia, especially in southern Missouri, and are only suitable in the north. A combination of earliness and disease resistance is needed in future strains. Other matters discussed are diseases and their control, preparation of the land fertilizers, harvesting and the use of oats as companion crops for sweet clover and lespedeza.—M.E.E

FRANCE, Ministère de la France d'Outre Mer. Bull Agron. No. 2. La riziculture aux États-Unis [**Rice cultivation in the United States.**] By *M* *Rossin*. 1946. pp. 62. **49**

Rice cultivation in the United States is o interest not because of quantity (she contribute only 0.7 per cent of the world production of rice but because conditions are the reverse of those i the great rice producing regions of the world. Th three rice growing areas in U.S.A. are the prairie south-west Louisiana and south-east Texas, th prairie of the eastern part of Arkansas, and th valleys in the interior of California. The conditions common to each are high temperature between April and October, supply of irrigation wate soil sufficiently impermeable to prevent loss water, and drainage facilities. Each of these conditions is examined. An illustrated account cultivation is given under the following heads: th irrigation network; preparation of the ground fo sowing and for irrigation; sowing of rice; varieties cultivated and their characteristics; irrigation and drainage; harvesting, threshing, an storage; weeds, diseases and pests; rotation (variously wheat, oats, lespedeza, soybean and pasture fallow); and maintenance of soil fertility. I this last connexion is pointed out the difference i attitude shown by the United States farmer an the French peasant regarding care of the soil. Th former takes the short sighted view; the latter th long term view. The processing of rice (cleaning skinning, bleaching and polishing) is not done b the farmer but is a matter for farmer co-operativ societies and for private industrial firms. Th product is exported largely to Hawaii, Porto-Ric and Cuba. The economics of rice production i discussed.—D.B.

YANG, S. J. **Cultivation of winter rice and th system of double cropping in Szechuan.** *Nun* *Pao* **6.** 485-90. 1941. **49**

A survey is made of the rice fields in Szechuan 70 per cent of the fields are found to be usable fo the winter cultivation of rice if some measures o water conservation are practised. By consecutiv plantings of early and late varieties of rice 2 crop can be had in a year. Experiments and result along this line are discussed.—From H. C. Yin Peiping, China.

MOH, P. C. **Mixed planting of early and late rice i Kwangsi.** *Nung Pao* **7.** 70-2. 1942. **49**

Several methods of obtaining a second harves of rice are practised in China. (1) In the south late variety is planted after the first harvest (2) In the south-eastern provinces the secon planting is made while the first crop is stil in the field. (3) In the south-west the regenerated rice is cultivated, and (4) in Kwangsi there is the practice of the simultaneous mixed planting of early and late varieties. The present paper is chiefly concerned with the last practice. It surveys the geographical distribution, the local methods of practice and the general characters of mixed rice cultivation. The practice is found to be advantageous over the others in that, (1) only half of the quantity of seeds is used, (2) about half of the labour is required in comparison with the practice of 2 plantings, (3) increased yield, (4) eliminating the use of seedling field (i.e. direct sowing instead of transplanting), and (5) lessening the possible loss due to autumn flood. Plans for extension and improvement of the practice are briefly discussed.—From H. C. Yin, Peiping, China.

YANG, S. J. **The cultivation of regenerated rice and its future in Hunan and Szechuan.** *Nung Pao* **5.** 46-52. 1940. **500**

Briefly the cultivation of regenerated rice consists of harvesting an early rice and leaving the stalks to regenerate new tillers for a second crop. The practice is found in Japan, Formosa and part of China, especially in Hunan, Hupei, Szechuan, and Kweichow province where the climate and water supply are suitable. The present paper gives a comprehensive survey of the practice and a thorough discussion on its various aspects.

The problem of cultivation is resolved into several factors, (1) water supply and depth of flooding, (2) soil fertility and fertilization, (3) variety differences and harvesting time, (4) length of the remaining stalks, (5) lodging, (6) ploughing, (7) influence on winter crops and green manures, and (8) losses due to insects and birds. The yield of the regenerated rice is between 50-150 catties per mou, about 20-30 per cent of the first crop. The quality is better than the first harvest, it is less uniform but much more palatable. The combined yield of the 2 harvests is about the same as that of 2 consecutive plantings in one year at the same locality.

Regenerated rice is of special importance in a bad year when the first harvest is poor. This is especially marked after drought but not so significant after flood, wind or insect damages when most plants fail to regenerate.

The government plan of promoting regenerated rice is discussed and a thorough investigation of the local practice and land utilization is urged. Improved cultivation of regenerated rice is believed to be a simple and effective way of increasing food production.—From H. C. Yin, Peiping, China.

YANG, L. C. and LIU, C. T. **Rice cultivation after tobacco or hemp.** *Nung Poa* **9.** 369-82. 1944. **501**

Two local methods of planting rice after tobacco or hemp are commonly practised in Szechuan, (1) retransplantation which consists of germinating rice in the usual manner and transplanting the seedlings temporarily in another field until the tobacco or hemp field is ready, (2) delayed planting which consists of late sowing and late transplantation.

Experiments were made in 1940-2 to compare the 2 methods of planting, the time of sowing and transplanting, and the performance of different varieties of rice. The results showed that transplantation should be made no later than early May. Rice transplanted later than this gave poor growth and yield. The method of retransplantation was better than delayed planting. The response of different varieties of rice differed greatly. Generally speaking the early-maturing varieties were less adaptive or more responsive to the time of transplantation and suffered more losses when sowing or planting was delayed. They were photoperiodically indifferent and their vegetative period was less dependent on external factors. The late varieties were more adaptive and therefore more suitable for the present purpose. They were short-day plants. Their vegetative period and yield were less influenced by the lateness of sowing and transplanting.

Rice stem borer caused more damage in late plantings.—From H. C. Yin, Peiping, China.

ALABAMA Agricultural Experiment Station. Progr. Rep. Ser. No. 34. **Grain sorghum production in Alabama.** By *D. G. Sturkie* and *T. H. Rogers.* 1947. pp. 12. **502**

Alabama farmers are greatly in need of a drought-resistant crop that will produce large yields of grain and forage. Grain sorghum appears to be such a crop. The uses of the crop, its place in the rotation, recommended varieties and production method, seed treatment, fertilizers, harvesting and storing are reviewed.—P.M.

ЭЛКОНИН, Н. Г. Пути повышения урожайности пшеницы и ячменя на обеспеченной богаре Таджикистана. *Селек. Семеновод.* 1946. *No.* 6. стр. 35-42.

ELKONIN, N. G. [**Methods of increasing the yields of wheat and barley on unirrigated land in Tadžikistan.**] *Selek. Semenovod.* 1946. No. 6. pp. 35-42. **503**

Most of the annual rainfall is from November to May, and most of all in April and May. The summer is hot and dry ; but wheat and barley can be sown when the rains of autumn have begun, or are about to begin, and can continue growth during much of the winter. There is evidence to show that autumn wheat and barley after a bare fallow ploughed not later than April, or after a cleaning crop, result in better crops than wheat and barley sown in spring.

New varieties which do not lodge, and which resist fungous diseases are still needed, and some promising varieties are briefly described. Other requirements for the successful cultivation of autumn wheat and barley in the conditions prevailing in Tadžikistan are also discussed. They include top dressing in spring, autumn peas ploughed under as green manure in spring, and various tillages.—I.Z.

БОГДАНОВ, П. Н. Корневая система и урожай яровой пшеницы. *Соц. зерн. Хоз.* 1946. *No.* 2-3. стр. 85-99.

Bogdanov, P. N. [**Root system and yield of spring wheat.**] *Soc. zern. Hoz.* 1946. No. 2-3. pp. 85-99. **504**

Spring wheats in the south-east USSR are subject to great fluctuation in yields in different years. This problem has been studied in the Laboratory for Spring Wheats under the direction of A. P. Šehurdin during 1939, and 1943-5. The factors affecting yields which have been under observation include soil type, seasonal moisture content and retention of snow in relation to rooting of the different varieties of wheat. It is concluded that to maintain a stable yield it is necessary to ensure that moisture is not only guaranteed, but utilized. For satisfactory utilization, measures for increasing effective growth of embryonic and coleoptile roots are essential.—M.H.

КАМИНСКИЙ, А. Е. Размещение яровой пшеницы на Юго-Востоке СССР. *Соц. зерн. Хоз.* 1946. *No.* 2-3. стр. 127-32.

Kaminskiĭ, A. E. [**Distribution of spring wheat in the south-east USSR.**] *Soc. zern. Hoz.* 1946. No. 2-3. pp. 127-32. **505**

The introduction of herbage rotations with fallows in the grain areas of this region is described. The following table indicates areas sown to wheat in kolhozes of the south-east in 1940 and in the year of introducing the rotation (in thousand ha.) :

	1940	rotation Year of	decrease — increase +
Tambov	172.6	356.0	+ 183.4
Penzensk	361.4	417.0	+ 55.6
Kuĭbyšev and Uljanov	1064.8	923.0	— 141.8
Saratov	1267.9	1078.0	— 189.9
Stalingrad	1263.6	1071.0	— 192.6
Čkalov	1101.4	1070.0	— 31.4

—M.H.

СМИРНОВ, Н. П. Стерневые посевы в Сибири. *Селек. Семеновод.* 1946. *No.* 4-5. стр. 49-55.

Smirnov, N. P. [**Sowing on stubble in Siberia.**] *Selek. Semenovod.* 1946. No. 4-5. 49-55. **506**

Attempts to grow winter wheat in the Siberian steppes failed because the seed was sown on cultivated fallows in the unconsolidated soil of which ice crystals were formed. These damaged the roots of the seedlings not because of the low temperature but because of the physical effect exerted by them. The method recommended to overcome this and the equally damaging effect of twitch is to sow winter wheat or rye on the uncultivated stubble of spring wheat, or some other spring-sown cereal, which has followed either on cultivated fallow or a "seeds" ley which has been ploughed in and the land thoroughly cleaned.—I.Z.

Jensen, H. L. **Contributions to the nitrogen economy of Australian wheat soils, with particular reference to New South Wales.** *Proc. Linn. Soc. N.S.W.* **65.** pp. 122. 1940. **507**

About 4 million acres of this State are devoted to *Triticum vulgare* grown for grain. Since the usual rotation consists of wheat and fallow and very few nitrogenous fertilizers are used, it is imperative to discover why these wheat soils have not been exhausted by such monoculture continued over a period of 60 years. For this reason these experiments were undertaken to examine the various factors that influence the nitrogen balance of the soils. The distribution and numbers of nitrogen-fixing bacteria were determined and *Azotobacter* was found in 27 out of 85 soil samples. Nitrogen fixation experiments were conducted with soils under laboratory conditions and showed that the wheatland soils had very little nitrogen-fixing capacity. The continuous production of wheat must therefore deplete the nitrogen reserves of the soils and only by introducing leguminous crops into the rotation or by applying nitrogenous fertilizers judiciously can permanent loss of fertility be avoided.—M.E.E.

БАЛАШЕВ, Л. Л. и ГОДУНОВА, К. Н. Вопросы агротехники сорта. *Селек. Семеновод.* 1946. *No.* 6. стр. 3-17.

Balašev, L. L., and Godunova, K. N. [**The cultivation of varieties.**] *Selek. Semenovod.* 1946. No. 6. pp. 3-17. **508**

The authors discuss a number of trials, the purpose of which was to compare cereal varieties at different levels of manuring, and sown on various dates and at various rates. The authors conclude that it should be possible to recommend not only a variety suitable to the conditions prevailing in a given district, but the methods of cultivation appropriate to that variety. They emphasize the importance of studying the fertility of the soil on which variety trials are carried out, and of observing the peculiarities which cause one to differ from another when responding to various treatments.—I.Z.

Burkart, A. Noticia sobre dos variedades de cebada desnuda, cultivadas en pequeña escala en la Argentina. [**Note on two varieties of naked barley cultivated on a small scale in Argentina.**] *Rev. argent. Agron.* **12.** 216-21. 1945. [Director, Inst. Bot Darwinion, San Isidro; Prof. Forage Crop Husbandry, Univ. Buenos Aires] **509**

Taxonomic notes are presented on *Hordeum vulgare* L. var. *coeleste* L. and *H. vulgare* L. var. *trifurcatum* (Schlecht.) Alef. The first-named variety, grown on a small scale as "Russian barley" in Patagonia and the province of Buenos Aires, appears to be of recent introduction. The second, an East Indian variety, is grown under irrigation in hill country of the north-western province of Jujuy and is locally known as "Chilean" or "German barley." The two varieties may be important in the future both for human consumption and as animal feed of high protein value.—G.M.R.

Wageningen, Instituut voor Rassenonderzoek van Landbouwgewassen. Berichten over rassenkeuze. [**Reports on the selection of varieties.**] *Maandbl. LandbVoorlDnst* **4.** 446-9. 1947. **510**

Reports Nos. 37 and 38, 1947, relate to trials of different varieties of winter barley and winter wheat respectively.—G.M.R.

Ekstrand, H. Höstsäden och vinterhärdighetsproblemet. [**Autumn-sown cereals and the problem of winterhardiness.**] *Försök och Forskning* **4.** 123. 1947. **511**

The investigations which have been conducted for a number of years by the Plant Protection Institute on overwintering of autumn-sown cereals and meadow plants and in connexion therewith on varietal resistance to the various parasitic winter diseases have not yet been completed. A brief summary of the results which have been obtained up to the present has now been published.

The opinion that cold is of primary importance and that the parasitic diseases can have no disastrous significance in overwintering of autumn-sown cereals must be revised and restricted to apply to conditions in south Sweden. The boundary for the cultivation of autumn-sown cereals to the north is determined in Sweden by winter-killing fungi. By breeding resistant varieties, the cultivation of such crops can with advantage be extended much further north. The investigations must be continued over a long series of years as variations in distribution of the different injuries from year to year are very great. The different fungi also exhibit varying distribution and virulence in different years: occasionally several occur simultaneously, when it is difficult to determine which is of the greatest significance. A full report is to be published later.—R.P.J.

РЯБОВ, И. Е. Сорта риса для орошаемых земель Заволжья. *Селек. Семеновод.* 1946. *No.* 7-8. стр. 72.

Rjabov, I. E. [**Rice varieties for the irrigated land of the Trans-Volga region.**] *Selek. Semenovod.* 1946. No. 7-8. p. 72. **512**

Improved varieties of rice are being prepared for areas which are to be newly irrigated. A hybrid of rice from Kazahstan and another from the Far East matures 13 to 33 days sooner than either parent. As a result of accustoming rice varieties to restricted irrigation, many of them give higher yields of grain than are obtained from rice grown under the usual regime of irrigation.—I.Z.

Sukhatme, P. V., Kadam, B. S., and Bhat, N. R. **Random sampling for estimating rice yield in Kolaba, Bombay.** *Proc. Indian Acad. Sci.* **23.** Sect. B. 194-209. 1946. [Imp. Council Agric. Res., New Delhi (P.V.S.), Dept. Agric., Bombay (B.S.K. and N.R.B.)] **513**

The Kolaba district covering 2165 sq. miles was selected as a typical area of the rice growing tract of Bombay for this survey. Yields of early, mid-late, and late varieties of *Oryza sativa* were determined by random sampling. Results showed that by sampling about forty-five villages in a district with three fields in each selected village, the yield average for the district could be estimated with a sampling error of about 5 per cent. Details of the sampling methods employed are given together with a statistical analysis of the returns.—M.E.E.

Bentancur, M. O. El sorgo azucarado (*Andropogon sorghum* **var.** *saccharatum* **Korn.**). *Rev. Fac. Agron., Montevideo* **41.** pp. 21. 1946. [Head of Genetical Station, Univ. Montevideo; and Nat. Comm. Forage Problem, Uruguay] **514**

A short account of other sorghums commonly grown as summer crops in Uruguay, namely, *Sorghum sudanense*, Grohoma sorghum (milo), and *S. caudatum* var. *feterita*, precedes a more detailed description of *Sorghum saccharatum*, its requirements and advantages, together with information on cultural methods, breeding, etc. Seven varieties are under observation at Montevideo and are very productive, 1944 sowings producing in 58 days 26,700 kg. per ha. from original seed and 17,200 kg. per ha. from home-grown seed. An advantage over Grohoma sorghum and *feterita* is that successive cuts may be taken according to need, while Grohoma and *feterita* give practically their whole yield in one cut.—G.M.R.

JORDBRUKARNAS FÖRENINGSBLAD. H-sällskapets sortförsök värdefull vägledning. Virtus- och Bronsveta något för östgötarna. [**The Agricultural Society's variety trials a valuable guide. Virtus and Brons wheat something for Ostergötland farmers.**] *Jordbruk. FörenBl.* **17.** 9. 1947. **515**

Since 1910 the Östergötland Agricultural Society has conducted annually at four different centres in the province a number of variety trials, with the object of assisting farmers in their choice of varieties. In 1946 in the trials with winter wheat Eroica gave 4370 kg. per ha. and Virtus 4303, while the figures for 1945 were respectively 3677 and 3,455 kg. per ha. During the five-year period 1942-46 Eroica gave on the average 4107 kg. per ha., and Ergo only 3717. Ankar lies approximately 1 per cent above Ergo in yield.

In the rye trials Petkus and Stål occupy the leading position. On account of its short straw Kungs II is widely cultivated. In the 1942-45 trials its yield was 4 per cent less than that of Stål. Where stiffness of straw is concerned Stål occupies an intermediate position between Petkus and Kungs II.

The leading varieties of oats in the province are Golden Rain II and Victory. Sun II since its introduction into the trials has surpassed Golden Rain II by 2.4 per cent.

In the barley trials Maja has given the best results. Balda, Freja and Ymner are new varieties with good yield.

Among the spring wheat varieties Diamant II predominates in the province to the extent of 80 per cent, largely owing to its earliness. Brons in the 1942-46 trials gave a 7 per cent higher yield than Diamant II but is slightly later than that variety. Under normal conditions Brons is decidedly superior to Diamant II and should replace it. Progress is a fine variety, but it is late, and in the trials was inferior to Diamant II in yield.—R.P.J.

MÁNDY, G. Adatok a hazai termesztett búzák fajtarendszertanához. [**Classification of wheat varieties grown in Hungary.**] *Agrártudományi Szemle* **1.** 22-34. [English summary, p. 34.] 1947. **516**

Wheats indigenous to Hungary and also introduced varieties can be classified according to the system of Körnicke-Werner in Handbuch der Getreidbaus: (Parey). Berlin, 1885. The Hungarian wheat varieties belong mostly to the awned type with red kernel.—M.H.

SALOHEIMO, L. Resultaten av sortförsök med vårvete på Finska Mosskulturföreningens Karelska försöksstation åren 1936-45. [**Results of variety trials with spring wheat at the Karelia Experiment Station of the Finnish Moor Cultivation Association during the period 1936-45.**] *Finska MosskFören Arsb.* **50.** 19-21. 1946. **517**

In Karelia " Vaara " soil (the term " vaara " is used with reference to usually extended moraine heights, which frequently have a rock formation and comparatively long sloping sides) is the most important for the cultivation of spring wheat, although this crop can be successfully grown on low moor soil, particularly during warm summers. Sphagnum peat soil was not suitable for the cultivation of wheat. On low moor the growing period was 6 to 9 days longer than in the " vaara " heights, and the crop was richer in protein than on "vaara" soil.

Diamond wheat was the most high yielding variety on " vaara " soil. Sopu and Hopea grew well under Karelian conditions. Sopu was the best spring wheat on sphagnum peat soil. Tammisto's new bred varieties Tammi and Kimmo gave a larger yield than Diamond on low moor soil. As these varieties are in addition 3 to 5 days earlier than Diamond, and Tammi in particular has very stiff straw they can probably be recommended for low moor cultivations, but they have not yet been included in trials for a sufficiently long period to permit of their cultivation value being assessed with certainty.—R.P.J.

THE " COMMONWEALTH " AGRICULTURIST. **Wheat and oats. New varieties.** *Commonw. Agrics* **17.** 130-3. 1947. **51**

The Orient variety of *Avena sativa* has been developed from a cross between Palestine and Dawn oats. It is particularly valuable for its high grain yield after the crop has recovered from winter grazing. This new oat is early maturing short in the straw and is specially useful in the Mallee where it has yielded 16.2 bushels per acre. Diadem wheat combines the high flour quality o White Fife with the reliable yield of Ghurka. This *Triticum vulgare* variety threshes easily, stands well and is moderately resistant to flag smut.—M.E.E.

BURMA, Director of Agriculture. Market Survey No. 14. **Report on the marketing of maize in Burma.** 1947. pp. 40. **51**

The report deals with aspects of maize cultivation under the following heads (a) supply; (b demand; (c) wholesale prices; (d) preparation fo market; (e) handling and transportation; (f assembling; (g) distribution; (h) grading an standardisation; (i) conservation; (j) processin and distribution of maize products; (k) seed; (l weights and measures and units of sale. Appendices refer to areas under maize in Burma for th 35 year period 1901-02 to 1935-36, quantities an values of Burma's maize exports together wit destinations, both foreign and coastal, during th three years 1934-35 to 1936-37, monthly export figures for the same three year period, and fortnightly prices for the five years 1932-33 to 1936-37. —G.M.H.

БУДКОВ, А. Ф. Семеноводство местных сортов. *Селек. Семеновод.* 1946. *No.* 4-5. стр. 35-8.

BUDKOV, A. F. [**Seed production from local varieties.**] *Selek. Semenovod.* 1946. No. 4-5. pp. 35-8. **520**

The author explains how to produce in 5 years élite seed of local cereal varieties. The explanation is accompanied by a diagram. Figures to prove the effectiveness of the method are cited from an experiment with a winter wheat, Sandomirka. The trouble of annually laying down a selection nursery can be avoided by propagating the élite seed without such trouble, but in the meantime maintaining the original population, which can be drawn upon should the élite varieties show signs of falling off in quality.

It is sufficient to renovate the élite seed of self-pollinating plants every 5 or 6 years, without the trouble of laying down selection nurseries every year.—I.Z.

ТИХОНОВ, П. М. и НАДЕЕВ, Б. Х. О продуктивных качествах семенного материала. *Селек. Семеновод.* 1946. *No.* 4-5. стр. 12-24.

TIHONOV, P. M., and NADEEV, B. H. [**The productive qualities of seed.**] *Selek. Semenovod.* 1946. No. 4-5. pp. 12-24. **521**

Heavy seed with well-developed embryos and active enzymes produces the healthiest and most vigorous plants. Experiments with spring wheat and barley described have shown that such seeds can be produced by growing the seed-bearing plants under suitable conditions of environment and cultivation. Weight alone does not determine the quality of seed ; for seeds of the same weight but produced by plants reared under dissimilar conditions or coming from dissimilar environments, do not develop into equally healthy and vigorous plants.—I.Z.

РЕПИН, А. Н. О сроках уборки кукурузы на семена. *Селек. Семеновод.* 1946. *No.* 6. стр. 75-7.

REPIN, A. N. [**The date of harvesting maize intended for seed.**] *Selek. Semenovod.* 1946. No. 6. pp. 75-7. **522**

Lysenko's advice to harvest cereals when the grains are in the waxy stage because a cold summer or a rainy autumn have delayed ripening, was here applied to maize. The observation of changes in the moisture content of the grain, both when on the plant and when being dried in attics, lofts, and sheds, leads to the conclusion that seeds harvested early and dried under suitable conditions retain their viability.—I.Z.

ЯАКОВЛЕВ, А. Г. Хранение переходящих фондов семенной ржи. *Селек. Семеновод.* 1946. *No.* 4-5. стр. 74-6.

JAKOVLEV, A. G. [**The storage of rye seed from the preceding year.**] *Selek. Semenovod.* 1946. No. 4-5. pp. 74-6. **523**

After discussing various examples of successful and unsuccessful storage of rye seed, the author concludes that the seed loses its power of germination usually during the summer of the current years when, because of the high temperature, moulds and bacteria develop and destroy the embryos. He recommends the following measures for keeping the temperature in grain stores at 10° to 15°C. during winter and as low and unvarying as possible. Harvesting the grain only when fully ripe and containing not more than 15.5 per cent moisture ; storing it spread out in well-built sheds, and not in sacks ; turning it over with a spade at intervals, but not later than the end of cold weather in spring ; and during the summer ventilating it by opening the windows only during the coolest nights.—I.Z.

GREENHAM, C. G. **Studies on chemical weed-killers with special reference to Skeleton weed** (*Chondrilla juncea* **L.**) **5. Preliminary trials with hormone-like weed killers.** *J. Coun. sci. industr. Res. Aust.* **19.** 341-6. 1946. **524**

Ch. juncea is still a pest in wheat-farming areas of Australia and in many places it is spreading rapidly. Of the hormone-like substances and commercial preparations used as weed control sprays in these trials, 4 chloro-2 methyl phenoxyacetic acid was the most toxic. A spray solution consisting of 7.5 per cent arsenic pentoxide killed the roots of all sprayed skeleton weed plants to a depth of 20 in. or more within 18 days. Concentration experiments with commercial sprays showed that efficiency of weed control increased with concentration, and the time factor involved with hormone-like weed-killers was eliminated by further experiments which proved that 2.7 per cent Methoxone killed skeleton weed roots to an average depth of 1.7 in. after 10 weeks, by which time regrowth occurred.—M.E.E.

BIGGER, J. H., DECKER, G. C., WRIGHT, J. M., and PETTY, H. B. **Insecticides to control the European corn borer in field corn.** *J. econ. Ent.* **40.** 401-7. 1947. **525**

In 1945, insecticides applied to single cross hybrids markedly reduced borer damage. Results of the 1946 tests show that having deposited a minimum amount of material, additional amounts gave no appreciable benefit, and that 5 per cent DDT dust was more effective than 3 per cent DDT dust. Later treatments were more effective than early applications, ground machinery gave better control than aeroplane application and sprays were possibly better than dry dusts.—P.M.

Decker, G. C., Apple, J. W., Wright, J. M., and Petty, H. B. **European corn borer control on canning corn.** *J. econ. Ent.* **40.** 395-400. 1947. **526**

Data were presented from tests conducted in 1945 and 1946 which establish the feasibility of second brood corn borer control on canning corn with insecticides in a region of high borer population. Borer reduction by the use of insecticides results in increased yields, reduced labour requirements in the factory, and affords label protection by reducing the hazard of borer contamination in the canned product.

Ryania dust and DDT in oil solution and as a dust were shown to be suitable insecticides for use in large scale airplane applications where delays in timing are not uncommon. The early applications in a three or four treatment schedule were found to be the most important. In the absence of a borer infestation DDT, benzene hexachloride and Ryania did not injure or stimulate the growth of the corn. DDT residues on corn foliage apparently weather rather rapidly at first and more slowly thereafter. Residues were greatest on the foliage and practically non-existent on the kernels. DDT applied in an oil solution was found to leave much higher residues than when applied as a water emulsion or as a dust. The chances of contaminating the canned product with DDT are very remote. Residues on other plant parts are such that they may have some bearing on the feeding of crop remnants to cattle.—Authors' summary.

Hamner, A. L. **Dusts for protecting seed corn from insects.** *J. econ. Ent.* **40.** 574-5. 1947. [Miss. Agr. Exp. Sta. State College] **527**

Dusts containing DDT protected corn from the attack of the rice weevil, Angumois grain moth and Indian-meal moth for a period of 223 days. A 3 per cent dust was the most effective and did not affect the germination. Arasan, a fungicide, gave a high degree of protection.—From Author's summary.

Farmer's Weekly, Bloemfontein. **Control of maize stalk-borer.** *Fmr's Wkly, Bloemfontein* **74.** 57. 1947. **528**

In the view of the Division of Entomology the maize stalk borer ranks as the most important of all pests which affect the prosperity of the farmer in the Union. It has been established that a low percentage (2½ per cent) of DDT powder is highly toxic to the stalk-borer. The rate of application is approximately 15 lb. per morgen and the cost of powder in bulk to farmers is as low as £1 4s. 0d. per bag of 50 lb. The techniques of applying DDT powder involves a careful watch being kept on the young maize to detect the first sign of the appearance of the borers which hibernate in the soil. In the spring they move into the crop and gain access to the plant down the funnel. Their appearance shows up in random patches with telltale yellowing of the plants. This is proof that the first migration is in force and is the time for the application of the DDT. This is applied to the plant by careful hand dosing, the powder being poured directly into the funnel to reach the pest. If the dusting is left too late the insect may get down into the stalk and so be out of reach. Dressing at this late stage is without effect.—G.M.H.

Marchionatto, J. B. Nota sobre "Balansia claviceps," hongo parásito de las gramíneas. [**Note on *Balansia claviceps*, a fungus parasitic on grasses.**] *Rev. argent. Agron.* **14.** 175-6. 1947. **529**

A short, illustrated account. The fungus is found in the tropics on the genera *Setaria* and *Pennisetum*, of which it attacks the spikes.—G.M.R.

Feng, H. T., Yao, K., and Chien, Y. C. **Studies on the morphology, habit and life history of *Aglossa dimidiata* Haw. of rice.** *Nung Pao* **7.** 75-85. 1942. **530**

The moth, *Aglossa dimidiata* Haw. was widely distributed in China, Japan and India. It caused serious losses in rice storage in the south-eastern provinces. A number of the insects were collected and reared in the laboratory. The morphology, habit, etc. of the eggs, larvae, pupae and adults were studied. There were 2 generations in a year. The larvae live through winter, pupate in April and become adults in May. The eggs laid in May developed into adults and started to reproduce again early in September. Each female moth gave 500 eggs on the average. The larvae generally lived 80-100 days or even 4-5 months in winter.—From H. C. Yin, Peiping, China.

Chou, S. M. **The estimation of the damage done by the rice stem borer.** *Nung Pao* **6.** 686-8. 1941. **531**

In studying the damage caused by the rice stem borer it is necessary to differentiate 2 quantities, (1) the extent of infestation by the insect and (2) the actual loss which is further dependent upon the local climatic conditions. The methods and formulae now in use for estimating these quantities from field data are criticized. Modified formulae are given to yield more reliable and useful figures.—From H. C. Yin, Peiping, China.

АЛОВ, А. С. К вопросу о взаимодействии прорастающих семян и внешней среды. *Доклады Всесоюз. Акад. С.-Х. Наук* 1946. *No.* 7-8. стр. 14-21.

Alov, A. S. [**Interaction between germinating seeds and the external medium.**] *Doklady Vsesojuz. Akad. S.-H. Nauk* 1946. No. 7-8. pp. 14-21. [All-Union Res. Inst. Beet Production] **532**

A definite reciprocal action has been determined (in experiments with barley, wheat and beet eeds) between germinating seeds and the outer iquid medium. Just as a specific influence is hown by certain substances in the outer medium n the physiological processes of the germinating eed, there is also effected a changed composition nd reaction of the medium. This is usually made nore alkaline, the degree of alkalinity fluctuating nd depending on the reaction of the fluid used, its ffect on the inner physiological processes of the erminating seed, species of seed, and phase of its rowth.

The external medium shows also a pronounced ffect on activity of the seed's ferments. It increases the activity of one ferment but restricts hat of another, depending on composition of the nedium and species of seed.—M.H.

ACOBSEN, L., and OVERSTREET, R. **A study of the mechanism of ion absorption by plant roots using radioactive elements.** *Amer. J. Bot.* **34.** 415-20. 1947. [Univ. Calif., Berkeley 4] **533**

Behaviour of radioactive ions of strontium and odine in apical segments of the roots of barley was tudied. Activity was determined by means of a Geyer-Müller counter. Maximum absorption occurred within a few millimetres of the apex. Absorption increased with time and, in live roots, was nuch higher at 25°C. than at 0°C. The temperature effect was particularly marked in the case of odine. When inactive isotopes of strontium and odine were substituted for the radioactive sotopes the percentage of the initially absorbed activity decreased with time and the decrease was nuch more rapid in dead than in living roots. The curves produced are interpreted as indications of he formation of ion-binding substances in the protoplasm during aerobic metabolism.—D.B.

ИВАНОВ, П. К. Зимостойкость озимой ржи в различных фазах развития. *Селек. Семеновод.* 1946. *No.* 4-5. стр. 43-9.

VANOV, P. K. [**The hardiness of winter rye at various phases of development.**] *Selek. Semenovod.* 1946. No. 4-5. pp. 43-9. **534**

Monolith samples, 30 × 30 cm. in area and 5 cm. high, were taken from fields of winter rye luring the winter. They were thawed out in the lark at 10°C., then brought into the light where he rye seeds and seedlings were encouraged to grow at a temperature of 18° to 20°C. At this tage, the sprouting seeds and growing seedlings vere counted and divided into three categories, of which the last consisted of seedlings which had eached the 2- or 3-leaf stage. At later dates additional germinations and sprouting seeds, and also lead seeds and dead seedlings, were counted. These and a few other counts and measurements formed the data from which conclusions were drawn as to the rate of mortality among the seeds and seedlings. The conclusions are summarized in some ten tables. The following are some of the main items of interest. As the sprouts increase in length, and the stored sugar of the endosperm is replaced by that of photosynthesis, the seedlings become hardier, reaching the highest point not, as has been supposed, during the tillering stage but before it. Seeds which had not sprouted by the onset of winter were mostly doomed. The practical conclusions drawn from the data are that if high rates of mortality and seed for sowing are to be avoided, it is essential to sow winter rye without delay in a seed bed which encourages rapid and full germination.—I.Z.

WATSON, S. A. and NOGGLE, G. R. **Effect of mineral deficiencies upon the synthesis of riboflavin and ascorbic acid by the oat plant.** *Plant Physiol.* **22.** 228-43. 1947. [Univ. Illinois, Urbana (S.A.W.) and Blandy Exp. Farm, Univ. Virginia, Boyce (G.R.N.)] **535**

In immature cereals cut for fodder, vitamins are maximal at the jointing stage. The effect of mineral deficiencies on the riboflavin and ascorbic acid content of oat plants at this stage is considered in this paper. The substances were estimated in 6-week-old plants sown in gravel on 16.3.42 and, following three weeks' irrigation, with complete nutrients, subjected to various mineral deficiencies. Visible symptoms were not marked when K or P were deficient : S deficiency slightly reduced size, lack of Mg induced chlorosis. Specific symptoms were marked when N or Ca were withheld. All deficiencies resulted in a low uptake of the element in question. The concentration of ascorbic acid in leaves was considerably *increased* by lack of Mg or of K, and in the stems by lack of Mg. It was reduced in both by N deficiency. There is some evidence that a negative correlation exists between the accummulation of Mg and K in leaves and their ascorbic acid content. Riboflavin concentration on the other hand, is highest in control plants, and is notably reduced in leaves by lack of Ca, Mg and N, while in stems only N has a marked effect. Riboflavin content is highly correlated with growth, indicating possibly a direct dependence of growth on riboflavin synthesis. It is also highly correlated with N intake : a relation with protein synthesis is suggested. Riboflavin is mostly located in leaves, but there is evidence that the small amount in the roots is synthesised there, rather than transferred from the leaves.—O.N.P.

CHU, T. C. **Water content of rice and the method of determination.** *Nung Pao* **6.** 610-5. 1941. **536**

Critical discussions were made on the different methods of determining the water content of rice.

Some data were presented on the water content of native varieties of rice and its relation to atmospheric humidity. Practical importance of water content was discussed.—From H. C. Yin, Peiping, China.

Marino, A. E. Estudio estadístico de la correlación entre las lluvias y los rendimientos del maíz. [**Statistical study of the correlation between rainfall and maize yield.**] *Rev. argent. Agron.* **14.** 189-209. [English summary, pp. 208-9.] 1947. [Prof. Agric. Univ. La Plata; formerly Div. Maize Prod., Min. Agric. Argentina] **537**

The study is concerned with the central maize belt of Argentina, comprising the north-western part of the province of Buenos Aires, the south of Santa Fe and the south-east of Cordoba, and covers the period 1923 to 1942 inclusive. Correlations and regressions were calculated for the rainfall of November, December, and both months together. In some cases other combinations were tried, including October as well as January.

In twelve out of the twenty districts included in this study, yields were statistically correlated to the amount of rain in December, a sharp differentiation being observed in the districts of Buenos Aires as compared with those of the other two provinces. Correlation coefficients for November rainfall were generally low, the significant coefficients pertaining to Santa Fe and Cordoba. The combined rainfall of November and December resulted in higher correlation coefficients than the rainfall of the individual months, being significant in seventeen out of the twenty districts. Curvilinear regressions also were calculated for the combined rainfall of November and December, the tests of curvilinearity being significant in eleven districts. Regression equations and correlation coefficients, with other pertinent data, are given.—From author's summary.

КАБАНОВ, П. Г. Климатические условия возделывания яровой пшеницы на Юго-Востоке. *Соц. Зерн. Хоз.* 1946. *No.* 2-3. стр. 65-76.

Kabanov, P. G. [**Climatic conditions of cultivating spring wheat in the south-east USSR.**] *Soc. Zern. Hoz.* 1946. No. 2-3. pp. 65-76. **538**

In the south east there are three major, and diverse, agricultural areas comprising the forest-steppe, the steppe and semi-desert steppe. In the steppe there is insufficient moisture for uninterrupted plant growth during the whole vegetation season, and towards the end of the summer the plants dry out and the steppe temporarily assumes the appearance of the desert. The length of this desert phase gradually increases towards the Aral-Caspian lowland area.

Change in weather conditions affects spring wheat and is one of the chief causes of fluctuation in yields. Agronomic measures designed to obviate these variations are recorded for different zones, with special consideration to stage of plant growth and the occurrence of dry or wet years.—M.H.

Chinoy, J. J. **How drought affects Indian wheats.** *Indian Fmg* **8.** 72-4. 1947. [Indian Agric. Res. Inst.] **539**

An account of the work done with exotic and Indian varieties of *Triticum* spp. for comparison of yields, time of flowering, ear tiller ratio and ripening period. Selection of wheat varieties for different localities is possible by correlating yield with temperature and humidity during the ripening period. Commercially important varieties have been classified according to their drought resistance; all varieties have shown considerable resistance during early stages of growth when irrigation may safely be withheld, but lack of water during the " shooting" and flowering stages proves extremely detrimental to the final yield. An alternate soaking and drying treatment of wheat seed has been developed for inducing drought resistance and the use of chemicals instead of water for this purpose also induces resistance to salinity. Further experiments on the limit of dessication of wheat seedlings and their viability after storage are being conducted.—M.E.E.

LEGUMES AND GRAIN LEGUMES

Mann, H. H. **Pulse grain crops in the Middle East.** *Emp. J. exp. Agric.* **15.** 249-59. 1947. **540**

A review of chickpeas (*Cicer arietinum*), vetches (*Vicia ervilia, V. sativa, V. tenuifolia*), lentils, broad bean (*Vicia faba*), haricot bean (*Phaseolus vulgaris, P. mungo, P. radiatus, P. aconitifolius*), peas, cowpeas (*Vigna sinensis*) and other pulse grains grown in the Middle East.—G.M.H.

ШЕНДЕРЕЦКИЙ, Э. И. Продвижение фасоли на север. *Селек. Семеновод.* 1946. *No.* 7-8. стр. 70-1.

Šendereckiĭ, E. I. [**Extending *Phaseolus* cultivation northwards.**] *Selek. Semenovod.* 1946 No. 7-8. pp. 70-1. **541**

Experiments in 1944 and 1945, when seventy varieties of *Phaseolus* were grown in latitudes more northerly than was hitherto believed feasible showed that, if the beans were sown after all danger of frost was past, and the temperature of the soil was between 10° and 12°C., yields of 40 or more centners of seed per ha. could be expected from some varieties. There is no necessity to import seed from elsewhere for sowing.—I.Z.

Kerle, W. D. **Soybeans.** *Agric. Gaz. N.S.W.* **58.** 227-31 and 295-8. 1947. **542**

Among the many varieties of *Soja max* grown or tested in New South Wales there are several of particular importance for their grain qualities. The highest yield is given by Potchefstroom 169 which is particularly valuable for its non-shattering eed, has a cream-coloured grain and is suitable for canning and all edible purposes. It matures in about 130 days and has an oil content of 21 per cent. A very similar variety is Easy Cook which is used as a green vegetable, but the fact that it hatters and does not yield heavily is placing it n disfavour. An earlier maturing variety for he shorter season districts is Haberlandt which has an oil content of 19.15 per cent and protein 41.73 per cent. Other early varieties are Lincoln, Dunfield, and Richland which are fairly similar n oil and protein contents.

The best growing conditions for soybeans are provided by loamy soils, moderate rainfall and noculated seed. Details are given for soil preparation, times and methods of sowing, after cultivation and rotations. Harvesting for grain is commenced when the beans are in the hard dough stage, and combine harvesters effect a saving in labour although allowing slight grain losses. Average yields in New South Wales are only 7 bushels per acre but much higher yields have been obtained in varietal trials.

The manifold uses of this field crop are described, and an even later article than the popular food products and industrial oils is a manufactured fibre resembling scoured wool. Although not yet commended for commercial production in this State, the economic aspect of soybean growing must steadily increase in the future.—M.E.E.

Lange, W. H., Jr., and Smith, L. M. **Control of a leaf miner on peas.** *J. econ. Ent.* **40.** 496-9. 1947. [Calif. Agric. Expt. Sta.] **543**

Liriomyza orbana severely damages crops of *Pisum sativum* during autumn in California. Sugar beets are a favourite host and when grown in the proximity of pea fields they tend to breed large numbers of flies. Only mild control was obtained from DDT dusts, but during 1946 the new chlorinated hydrocarbon chlordane used as a 5 per cent dust with five applications at 26 lb. per acre gave a 98 per cent control.—M.E.E.

Jauch, Clotilde. La " mancha chocolate " de las habas. [**Chocolate spot disease of broad beans.**] *Rev. Invest. agric., B. Aires* **1.** 65-80. 4 pls. 1947. [Head of Reg. Lab. Phytopathology, José C. Paz, Argentina] **544**

This disease causes more damage than does any other fungous disease to cultures of *Vicia faba* in the vicinity of Buenos Aires. Two species of *Botrytis* are concerned, namely, *B. fabae* Sardiña and *B. cinerea* Pers. The symptoms of the disease, characters of the parasites, inoculation trials, influence of environment, effect on the susceptibility of different bean varieties of sowing at different times, and the effect of spraying with 1 per cent Bordeaux mixture combined with different times of sowing are described. A typical and severe attack by *Ascochyta fabae* Speg. is also described.—G.M.R.

Reichert, I., and Palti, J. **Rust and chocolate spot of broad beans in Palestine.** *Pal. J. Bot. Rehovot Ser.* **5.** 202-13. 1946. [Divn. Plant Path., Agric. Res. Sta. Jewish Agency for Palestine, Rehovot] **545**

Experiments were made between 1939 and 1943 to determine ways and means of growing broad beans in Palestine without excessive risk of losses from attack by rust (*Uromyces fabae*) and chocolate spot (*Botrytis fabae*). A study of field records in relation to monthly macroclimatical records has led to the conclusion that in Palestine the appearance of chocolate spot is not markedly affected by the mean daily temperature and under comparable conditions the disease appears at means of 10°C. and 16°C. on very similar dates. Rust, on the other hand, is much dependent on the level of temperature, failing to appear in months with daily means of 10°C. and less, occurring occasionally at means of about 12.5°C., but appearing regularly only at 14°C. or above. Observations concerning the effect of various levels of relative humidity and rainfall were less conclusive.

Four trials showed rust and chocolate spot to be controlled by spraying with the proprietary cuprous oxide spray Perenox, at $\frac{1}{8}$ per cent strength (0.17 per cent Cu.) while lime-sulphur sprays were much less effective. Control was adequate where applications of Perenox began just after disease appearance and were repeated at intervals of 10-14 days. Spraying increased the yield of green pods significantly where the attack of rust was early and severe.—G.M.H.

Robertson, T. S. B. **The accumulation of vitamin C during germination in peas.** *Aust. J. exp. Biol. med. Sci.* **25.** 41-6. 1947. [Univ. of Adelaide] **546**

As a result of four experiments with Blue Boiler and Dunn varieties of *Pisum sativum* the fact was established that peas can still produce ascorbic acid even though the embryos have been removed. After soaking for 18 hours the " treated' peas were germinated under different degrees of light and darkness and in some cases produced higher concentrations of vitamin C than those obtained from whole peas under the same conditions. Light was not necessary for vitamin C synthesis in the cotyledon, but it was necessary before synthesis could occur in the leaves. Results showed that the processes responsible for this synthesis are inherent in the cell of the cotyledon, and are in no way dependent on the growth of the embryo above it.—M.E.E.

ГЕНЕРАЛОВ, Г. Ф. Содержание белка и крахмала в семенах гороха в зависимости от географических и метеорологических условий. *Селек. Семеновод.* 1946. *No.* 4-5. стр. 56-9.

Generalov, G. F. [**The content of protein and starch in pea seeds and its relationship to geographical and meteorological conditions.**] *Selek. Semenovod.* 1946. No. 4-5. pp. 56-9. **547**

The author cites evidence to show that the percentage difference in the content of protein varies between about 19 and over 30, and in the content of starch, between about 44.6 and 55.6. Such differences, arising from differences between varieties, amount to no more than between 3 or 4 per cent (at the most, 5 or 6 per cent) as regards protein and not more than 15 per cent as regards starch. The seed of late varieties with green seeds usually contains more protein than that of varieties with yellow-pink seeds, but these, on the other hand contain more starch.—I.Z.

Jacobs, W. P. **The development of the gynophore of the peanut plant, *Arachis hypogaea* L. 1. The distribution of mitoses, the region of greatest elongation, and the maintenance of vascular continuity in the intercalary meristem.** *Amer. J. Bot.* **34.** 361-70. 1947. [Havard Univ., Cambridge, Massachusetts] **548**

The extent of the intercalary meristem, which gives rise to the gynophore after pollination of *A. hypogaea*, was investigated using cell division as the criterion of its pattern and position. Mitotic figures in the metaphase, anaphase and telophase were counted in a series of microtomed longitudinal sections (every tenth section at 10*u*). Number of mitoses in interfascicular cambium, epidermis, strands, pith and cortex were plotted against distance from tip. The region of maximal elongation was found to coincide with the region of maximal mitoses.

The morphological nature of the gynophore, i.e. whether root or stem, is discussed.—D.B.

Dyer, H. J. **Influence of potassium and sodium on metabolism of peanut cotyledons during germination.** *Bot. Gaz.* **108.** 570-81. 1947. [Hull Bot. Lab., Univ. Chicago] **549**

Cotyledons of *Arachis hypogaea* were fed with nutrient solutions containing, besides the essential nutrients, (a) potassium, (b) sodium replacing potassium and (c) neither of these elements during the first 15 days after planting.

From changes in dry weight, carbohydrates, fats and proteins it is suggested that potassium may have a specific function in protecting the liquid substrate from lipase, and that sodium may, to a certain extent, act as a substitute for potassium.—D.B.

Galston, A. W. **The effect of 2,3,5-Triiodobenzoic acid on the growth and flowering of soybeans.** *Amer. J. Bot.* **34.** 356-60. 1947. [Yale Univ., New Haven, Connecticut] **550**

The synthetic substance 2,3,5-triiodobenzoic acid (TIBA) which was known to induce flowering in vegetative buds of tomato was applied to short-day varieties of *Glycine soja* by spraying on leaves, injection in cotyledonary leaf or applied to the soil.

Results show that TIBA does not induce vegetative plants to flower but it augments the flowering response due to photo-periodic induction. Vegetative soybean plants exhibited the following morphological responses to TIBA: shortening of internodes, loss of apical dominance, epinasty of young leaves, and premature abscission of apical leaves and buds.—D.B.

Máthé, Imre. A szója-kukorica köztesvetésben észlelt növényklíma-viszonyok. [**Microclimatic conditions of soybeans and corn planted separately or jointly.**] *Agrártudományi Szemle* **1.** 385-97. [English summary, p. 397.] 1947. **551**

To determine why soybeans intercropped with corn thrive better and yield more, the author made observations on the microclimate of the mixed and single plantings. The data indicate (1) that soybeans at the beginning and end of their development flourish better when sown separately than when intercropped with corn; (2) on intercropped areas temperature in and above the soil is higher than in the case of unmixed planting; and the relative moisture is greater, while evaporation is less; and (3) corn grows more vigorously when intercropped with soybeans.

Tests are in progress to determine the effect of chemical composition of soybeans of single and mixed plantings.—M.H.

Burma, Director of Agriculture. Market Survey No. 13. **Report on the marketing of gram in Burma.** 1947. pp. 50. **552**

The report deals with aspects of gram cultivation in Burma under the following heads. (a) supply; (b) demand; (c) wholesale prices; (d) preparation for market; (e) handling and transportation; (f) assembling; (g) distribution; (h) grading and standardization; (i) conservation; (j) processing and distribution of gram products; (k) seeds; (l) weight and measures and units of sale Appendices refer to the area under gram in Burma for the 34 year period 1901-02 to 1934-35, quantities and values of gram imported by sea during e seven years 1925-29 to 1934-35, and quantities d values of Burma's gram export together with stinations, both foreign and coastal for 1928-29 1934-35.—G.M.H.

IL CROPS

LAS, F. P. El girasol. [**The sunflower** (*Helianthus annuus*).] *Ager* **3.** 111-4. 1947. **553**

A short account of the sunflower, its seed, its emical composition and its various uses for pain.—G.M.R.

LLSCHOP, J. **Groundnuts.** *Fmg S. Afr.* **22.** 705-12. 1947. [Experiment Station, Potchefstroom] **554**

There is likely to be a serious lowering of the umus content of the soil and a consequent ad- rse effect on its physical structure if groundnuts e not grown in rotation with plants which leave ore organic matter behind than groundnuts emselves. They should be grown in rotation ith maize, kaffircorn, millets or other crops hav- g extensive root systems or with sunflowers, nn hemp or similar crops which leave considerable sidues of organic matter and which decompose ry readily. The trash of all crops in the rota- on should be ploughed in as soon as it has been rvested in order to permit of their rapid decom- osition. If the trash is left on or near the surface the soil the groundnut foot-rot fungus may ultiply should climatic conditions be favourable.

The fertility of soils for groundnut production ould be kept at a high level by applying fertilizers preceding crops. New soils may have 300 lb. to 0 lb. of superphosphate per morgen (1 morgen =2.1165 acres) worked in shallow; poor or ex- austed soils may have the same, together with 10 12 tons of kraal manure. Where manure is not vailable fertilizer mixtures C (2:12:2) and D :13:3) may be used.

Fields should be evenly and closely covered y the plants for the successful production of oundnuts and for large scale production seeds ould be taken out of their perfectly protecting oody shells and treated with a seed protecting owder. Roots are usually well covered with itrogen nodules so inoculation with bacterial ltures is seldom necessary.

In most areas planting can take place from the iddle of October to the middle of December but ot until good rains have occurred. In warmer, ost-free, humid areas, planting may be delayed ntil January. As a general recommendation it is ggested that rows be 32 inches apart and that the eds be dropped 4 inches to 7 inches apart in the ws at a depth of 1½ inches to 3 inches, depending n the soil moisture conditions. Planting should not be shallow in the case of soils which are inclined to dry out readily.

The general average yields under good, bad and indifferent conditions are from 1000 lb. to 1200 lb. of unshelled nuts or, from 650 lb. to 800 lb. of shelled kernels per morgen. Where groundnuts are grown in rotation, fertilized and carefully planted and receive a fair amount of rain, yields of 2000 lb. to 2500 unshelled or 1300 lb. to 1600 lb. of shelled kernels are obtained. Under very good conditions especially under irrigation, yields of from 2500 lb. to 4000 lb. of unshelled nuts per morgen have been the rule.—G.M.H.

SMITH, E. G. **Linseed a valuable crop in South Island rotations.** *N. Z. J. Agric.* **75.** 83. 1947. [Rangiora] **555**

It is considered that linseed (*Linum usitatissimum*) is worthy of consideration on many South Island mixed farms. The old belief that this crop would not give its best yields unless grown on land out of browntop has not proved to be correct. Generally highest yields are obtained on land out of good pasture, but the crop can be grown successfully almost anywhere in a rotation if soil fertility is sufficiently high and the land free of weed seeds. Wheat is the most popular crop to follow linseed. Sowing a grass seed mixture with the crop is now common as it is a cheap method, and good pastures have been established in this way.

Cultural measures for satisfactory linseed yields are discussed.—M.H.

REYNTENS, H. Proeven op winterkoolzaad. [**Experiments with colza** (*Brassica napus*.)] *Med. Landbouwhoogesch. Gent.* **11.** 287-303. [French, English and German summaries, pp. 300-3.] 1946. [Plant Breed. Sta., Melle, Belgium] **556**

The experiments were concerned with planting distance, thinning, time of sowing, manurial treatment, and selection. Findings comprise the following :—Unthinned rows tend to lodge and give the lowest yield. The highest yield was obtained with a distance of 10 cm. between the plants in a row. Yield decreases as the distance in a row increases, while the average number of branches per plant rises. With good cultural technique a yield per ha. of 5000 kg., weighed immediately after threshing, can be obtained. Distance between the rows: the narrowest tested, namely, 20 × 10 cm., gave the highest yield, while the widest tested, 50 × 10 cm., gave the lowest; but distance between the rows does not affect the number of branches per plant so much as does distance between the plants of a row. Colza is sensitive in regard to the time at which it is sown, which should be early enough to ensure good root development before frosts set in. Winter hardiness is increased through thinning before winter. An application of 600 kg. ammonium nitrate per hectare ensures high yields, but no useful purpose is achieved by increasing the dose. Experiments in selection have shown this to be a promising method of increasing seed yield and of producing a leafy and winter hardy green fodder plant.—G.M.R.

Wageningen, Rijks-Instituut voor Rassenonderzoek van Landbouwgewassen. No. 31. Blauwmaanzaad, 1947. [**Poppy seed, 1947.**] *Maandbl. LandbVoorlDnst* **4.** 367-8. 1947. **557**

A report is presented on the productivity of four varieties of poppy (*Papaver somniferum*) as tested in 1947 by the Institute for Agricultural Crop Plant Varieties, Wageningen. This crop, grown for its seed, is confined almost entirely to the western and northern clay lands of the Netherlands. In 1946 it occupied 6600 ha. [the 1939 area was 2741 ha. only. 21ste Beschrijvende Rassenlijst, 1947].—G.M.R.

Dillewijn, C. van. Verslag van in het jaar 1942 door de Rijkslandbouwconsulenten genomen veldproeven met koolzaad. [**Report on field trials of rape seed conducted by the Rijk Agricultural Advisers in 1942.**] *LandbVoorlDnst Med.* No. 34. 1943. pp. 16. [Received 1947.] [Cent. Inst. Landbouwk. Onderzoek, Wageningen, Netherlands] **558**

Four varieties of rape seed (*Brassica napus*) were compared in 16 trials situated in different places. Information is given on the relative degree of winter hardiness, height of the plants, seed yield (100, 90, 83 and 80), and chemical composition. There was little difference in the content of dry matter, crude protein and fat in the different varieties, so that the yield of these substances per hectare was principally determined by the seed yield. The trials throw more light on the winter hardiness than on the productivity of the varieties.

Experiments in sowing at different dates from 12th August to 1st September led to no definite conclusions, although at the Heino Experiment Farm the two more winter hardy varieties appeared to yield most when sown at the earliest date while the less winter hardy varieties were more successful with late sowing. The application of nitrogen had favourable effects in two trials which had suffered little or not at all from frost, but no effect in a third trial which was severely damaged by frost.—G.M.R.

Bajai, J. Adatok egy napraforgótermesztési kízérletböl. [**Experiment on sunflower varieties.**] *Agrártudományi Szemle* **1.** 114-9. [English summary, p. 119.] 1947. **559**

Information is supplied regarding date of germination and ripening, vegetation periods, and relation of weight of disc and seed. The variet Lovászpatona gave the largest yield, and was fo lowed by Belye No. 144 and Belye No. 143.—M.H.

Berzaghi, M. N. Óleos vegetais como combust veis. [**Vegetable oils as combustibles.**] *Bo Agric. S. Paulo* **44a.** 251-66. 1943. [Receive 1947] **56**

The war-time shortage of fuel for motors le to the present study, which is concerned with cu tural conditions in the Brazilian State of São Paul Certain oil-seed plants are suitable for large-sca cultivation in the State, namely, in order of agr cultural importance :

	Seed yield lb. per acre
Soybean (*Glycine hispida*)	1600
Sesame (*Sesamum indicum*)	1200
Castor-oil (*Ricinus communis*)	1100
Sunflower (*Helianthus annuus*)	1000
Almond (*Prunus amygdalus*)	880

The yield of oil from these plants is :

	lb. per acre	Numbe of day
Sesamum indicum	564	150
Glycine hispida	208	120
Ricinus communis	440	180
Helianthus annuus	348	150
Prunus amygdalus	316	130

Cotton (*Gossypium barbadense*) was also co sidered, but for oil seed, the author found it woul be preferable to devote energies to the cultivatio of the plants listed above rather than to cotto The general characters, oil content etc. of the si plants are tabulated.—G.M.R.

André, E., and Kogane-Charles, M. [Madame Contribution à l'étude des graines et de l'hui de colza *Brassica napus* L. variété *oléracéa* D. [**Seeds and oil of colza,** *Brassica napus* **L. va** *oleracea* **D.C.**] *Ann. Agron., Paris* **17.** 393- 1947. [Lab. Corps gras, Paris] **56**

Seeds of certain Cruciferae emit, on grinding, disagreeable odour of cabbage ; this smell is qui different from the smell of mustard which is pr duced when these same ground seeds are digest with water. In *Brassica napus* var. *oleracea* t smell is particularly strong, hence colza oil is n used for food, only for lighting and greasing pu poses. The smell is reminiscent of the extreme volatile and evil-smelling methyl mercaptan, t presence of which has been established by chemic tests.—D.B.

OTTHOFF, P. Stockälchenschaden an Raps. [**Damage to rape caused by the stem borer, *Ditylenchus dipsaci* (Kühn).**] *Festschrift Otto Appel* 1947. 59. [Wolbeck bei Münster, Westfalen, Germany] **562**

Observations in Westphalia (1942 and 1945) nd in Bavaria (1943) indicate that *Brassica napus* nd *B. rapa* can act as hosts for *Ditylenchus dipci,* and that this should be taken into account in anning cropping systems, especially in conexion with rye.—G.M.R.

ÁRKÁNY, S. A napraforgó nemesítése és a fitomelán-kérdés. [**Sunflower breeding and the "phytomelan" question.**] *Agrártudományi Szemle* **1.** 97-101. [English summary, pp. 102-3.] 1947. **563**

The damage done to *Helianthus annuus* by unflower moth (*Homeosoma nebulela*) has ineased greatly in recent years, and breeders of this op have concentrated on resistant varieties. eeds with an "armour-layer" (=cell wall aterial known as phytomelan) have been studied 1943 for the first time in Hungary by the Initute of Genetics and Plant Breeding. The work still in progress, but certain theories are adanced from preliminary studies regarding the ause of development in the seed of phytomelan. -M.H.

LANK, F., and LUEDI, W. Über Hypokotyl- und Wurzelsprosse von *Brassica oleracea* L. var. *capitata* L. [**Shoots from hypocotyl and root of *Brassica oleracea* L. var. *capitata* L.**] *Ber. Schweiz bot. Ges.* **54.** 529-33. 1944. **564**

It has become the practice to allow cabbage lants to overwinter stored in a cool room. Some f these plants were found to have developed leafy prouts. Anatomical study of the leafy shoots evealed that some were of root others of hypocotyl rigin. Budding from the roots is well-known in nany species but has seldom been observed from he hypocotyl. Though worthy of note, sproutings rom the hypocotyl should not come as a surprise ecause the hypotcotyl retains its embryonic haracter for a longer period than other organs. Whole new plants can be produced from small secions of the hypocotyl.—D.B.

HILDEBRANDT, A. C. and RIKER, A. J. **Influence of some growth-regulating substances on sunflower and tobacco tissue in vitro.** *Amer. J. Bot.* **34.** 421-7. 1947. [Dept. Pl. Path. Univ. Wisc.] **565**

The influence on the growth of excised sunflower and tobacco tissue *in vitro* on synthetic media under controlled conditions of cysteine hydrochloride and of nine growth regulators, respectively, of the (1) indole, (2) napthalene, (3) naphthoxy, and (4) substituted phenoxy compounds has been studied.

Sunflower and tobacco tissue responded differently to the various growth regulators of different groups, to different compounds in the same general group and to different concentrations of any one compound. The general effect of the compounds was an increased wet weight at certain low concentrations but a decreased wet weight at higher concentrations.

Sunflower tissue was inhibited at very high dilutions of 2,4-dichlorophenoxy-acetic acid (1×10^{-13} grm. per litre) and 2,4-dichlorophenoxy-butyric acid (1×10^{-7} grm. per litre). Lower but still high dilutions (1×10^{-5} grm. per litre) of sodium, 2,4-dichlorophenoxy-acetate, para-chlorophenoxy-acetic acid, indole-3-acetic acid, and beta-naphthoxy-acetic acid inhibited growth. Stimulation appeared with high dilutions of sodium, 2,4-dichlorophenoxy-acetate (1×10^{-11} to 1×10^{-9} grm. per litre); 2,4-dichlorophenoxy-butyric acid, and indole-butyric acid (1×10^{-9} grm. per litre); alpha-naphthalene-acetamide (1×10^{-7} grm. per litre); alpha-naphthalene-acetic acid (1×10^{-13} to 1×10^{-7} grm. per litre); and indole-3-acetic acid (1×10^{-13} to 1×10^{-8} grm. per litre).

With tobacco tissue there was little or no increase in wet weight with any of the compounds, but a decreased wet weight commonly appeared at concentrations of 1×10^{-3} grm. per litre.

The water content of sunflower tissue was greater than that of tobacco tissue. Sunflower tissue incubated on media with para-chlorophenoxy-acetic acid and alpha-naphthalene-acetic acid had dry weights ranging from 4.6 to 6.8 per cent of wet weights. Tobacco tissue growing on media supplemented with alpha-naphthalene-acetic acid and indole-3-acetic acid had dry weights ranging from 5.3 to 9.9 per cent of the wet weights. The lowest relative dry weight appeared at those concentrations where the greatest wet weight occurred. Stimulation of the growth regulators in these three experiments appeared associated with a swelling of the tissues.

Tissue cultures may deserve attention as assays of certain growth regulators.—Authors' summary.

FRANCE, Ministère de la France d'Outre Mer. Bull. Sci. No. 1. Biologie, écologie et selection de l'Arachids au Sénégal. [**Biology, ecology, and selection of ground-nuts in Senegal.**] By *F. Bouffil.* 1947. pp. 107. **566**

A detailed account of the groundnut in Senegal. Botanical characters under the head of germination, flowering, fruit-bearing period and vegetation are discussed. After germination the main root develops rapidly with the secondary roots appearing some days later; all roots are without absorbent hairs. The nut has flowers both above and below ground, which can only be differentiated by their white calyx and their calicinal tube. Both types are fertile. Forty days or more is necessary for a fertilized flower to become ripe fruit ; maturity is reached when the inside of the shell is black, a white inside indicating an imperfectly ripened shell. In the shell itself, the higher grain is slightly longer than the lower one, the latter being heavier than the former in a normally developed plant.

The period of germination demands sufficient moisture to avoid withering of the grains, that of pre-flowering can stand relative dryness (but not drought). During the period of flowering, fruit bearing and maturity, there should be sufficient and well distributed moisture, preferably fairly frequent showers rather than heavy rains, separated by long intervals.

In French West Africa the external botanical characteristics of the groundnut with the exception of the growing position (creeping or erect) and the absolute precocity (simultaneousness of the apparent maturity and the physiological maturity) do not permit, within a limited region, differentiation between sub-species. The following botanical classification is based on these two characteristics.

A. hypogea	sub species	*africana*,	variety	*tarda*
	,, ,,	*africana*	,,	*precox*
	,, ,,	*asiatica*	,,	*tarda*
	,, ,,	*asiatica*	,,	*precox*

The varieties of the groundnut can be designated as 4, 3 or 2 seeded. Hereditary botanical characteristics which may be used in the selection of groundnuts are found only in the pods. They are (a) size and shape, (b) presence or absence of an aril, (c) depression of the pod, (d) ribs of the pod, (e) reticulation of the pod, (f) thickness of the shell, (g) size of the seed, (h) thickness of the tegument or pellicle, (i) colour of the tegument or pellicle.

The differentiation between "pods opening into two valves" and "achiscent pods" is false.

Selection is discussed in terms of choice of land, portioning out, scattering and depth of sowing, shelling harvest, etc. In 1945, out of the 50,000 tons of groundnuts distributed to Senegal, 8530 tons or some 7 per cent were selected.—G.M.H.

FIBRE CROPS

RIVAIN, J. B. Les nouveaux textiles concurrents du jute des Indes. [**New textiles which are competitors with Indian jute.**] *Cot. Fib. trop.* **1.** 86-90. 1946. [Soc. Fibres Coloniales] **567**

More than 99 per cent of the world's jute is produced in Bengal and the neighbouring states of Assam, Bihar and Orrisa. This constitutes a monopoly. Growing of jute outside this region is not contemplated but attention is being given by France, Holland, Belgium and Brazil, to the development of crops which would yield an equivalent fibre. Only those already used by the indigenous populations and those in which research is sufficiently advanced are discussed. They are a members of the Malvaceae. Dah (*Hibiscus cannabinus*) is an annual, 2 to 3 m. high, and muc used in tropical Africa for fishing nets and cordag Gouama (*H. sterculifolius*) grows wild ; it is als used for fishing nets and cord, but is less pliabl than jute. La Roselle (*H. sabdariffa*) is a slightl branched shrub, 2 to 4 m. high, growing in S America, the Antilles, India, Netherlands Indie Philippines, Madagascar and equatorial regions c Africa ; it needs a great deal of water and produce a high-quality thread. Lingue (*Sida rhombifoli* is an annual attaining a height of 1.5 to 2 m. ; i grows in drier soils (railway embankments) an produces a fibre equal to that of jute only mor supple and more resistant ; the crop is suited t Guinea and the southern Sudan. Paka (*Uren lobata*) is the competitive fibre in which development is most advanced ; it has a general distribution in Asia, Africa and S. America whereve soils are fertile and moist enough. Before the wa Madagascar produced 3000 tons per year from th wild plant. In the Belgian Congo the crop is carefully cultivated and 14,000 tons per year are produced.—D.B.

TOURGAY, N. Le coton en Turquie. [**Cotton i Turkey.**] *Cot. Fib. trop.* **1.** 67-79. 194 [Ministry of Agric., Turkey] **56**

The cotton industry is in course of full development as the standard of living of the populatio rises. Production has increased from 160,00 bales before 1914 to 325,000 bales in 1941. Ther was a set back to 25,000 bales following the war o Independence (1923).

The article gives an account of the history o cotton production in Asia Minor from pre-Christia times; the zones in which it is cultivated; th botanical characteristics and physical properties o the varieties grown; rotation; manuring; tillage irrigation; time and density of sowing; insect pest and fungous diseases; and yields. The cultivatio becoming increasingly mechanized. An accoun is also given of the industrial processes, processin of cotton seed oil, the cotton exchange and exports.

Cotton cultivation is organized and directe by a special branch of the Ministry of Agricultur There are two cotton improvement Stations, one a Adana, the other at Nazilli.—D.B.

DUCKER, H. C. **Possibilities of increased cotto production in East Africa. 5. Nyasaland an increased cotton production.** *Emp. Cotton G Rev.* **24.** 239-44. 1947. **56**

Before any possibility of increased cotton production in Nyasaland can be considered, competition from tobacco, the shortage of energet and ambitious native labour, entomological findings in respect of the major pest, Sudan boll-worm and a possible revolutionising of the attitude of th tive to work for himself in his own country, must taken into account.

Because of its size, Nyasaland cannot hope to nulate the larger territories to its north, but tton production of the order of 50,000 bales 00 lb.) per year should be possible. Land is ailable for such a production at conservative timates of yield and with due provision for other ops.

Of the three main cotton growing areas, the wer River area needs to change over from its esent mixed practices to the summer crop chnique if increased production is required in ste. On the other hand a longer term plan of ver and flood control and development of winter op cotton is to be preferred if the delay it will tail and the capital commitment it will need can faced. This alternative plan is sounder agri- lturally and socially and much more to the liking the Lower River natives than summer cropping. Northern Nyasa where winter cropping is the ly practical way of growing cotton, extension of e cotton lands is the only possibility for increased oduction. The Central Areas form the biggest tapped area of land for cotton in Nyasaland and re summer crop cotton must be grown. They fer excellent possibilities for development on a -operative farming basis. Organized settlement hemes for land at present unoccupied and re- ttlement schemes for land ineffectively occupied fer considerable promise with mechanical tillage a co-partnership basis.

Experience indicates that the country is best ited to the production of $1\frac{1}{16}$ in. to $1\frac{1}{8}$ in. bread and butter" staple, but a clear ruling on e class of lint is required in order that seed supply ay be properly arranged. See *Fld Crop Abst.* 1. ost. 318 and 2 Abst. 590.—G.M.H.

antmannen Svenskt Land. Produktionen av linfrö i Holland för export. [**Production of flax seed in the Netherlands for export.**] *Lantm. Svenskt Land* **31.** 902-3. 1947. **570**

The total flax area in the Netherlands is now tween 15,000 and 20,000 ha. and is likely to be creased. Flax seed is one of the country's most portant exports.—R.P.J.

ist, J. M., and Friederich, J. C. De cultuur van enkele bast- en bladvezel-leverende gewassen. [**The cultivation of some plants furnishing bast and leaf fibre.**] *Landbouwk. Tijdschr.* **59.** 337-45. 1947. **571**

An address presented to the 21st Congress on griculture in the Netherlands Indies, held at ageningen in December, 1946. A detailed count is given of the cultural methods employed the Netherlands Indies for the cultivation of *ibiscus sabdariffa* L. (selection and hybridiza- on of this plant are in progress, especially for resistance to *Phytophthora infestans*) ; *H. cannabinus* L. (less productive than *H. sabdariffa*, but resistant to *Phytophthora infestans*) ; *Corchorus capsularis* L. and *C. olitorius* L. (under trial) ; *Agave sisalana* Perrine and *A. cantala* Roxb. (breeding work in *Agave* was interrupted by the war).—G.M.R.

Macdonald, D., Fielding, W. L., and Ruston, D. F. **Experimental methods with cotton. IV. A study of the effects of gap-filling on the development and yield of cotton plants in poor stands of hand-planted cotton.** *J. agric. Sci.* **37.** 297-300. 1947. **572**

Experiments were carried out to measure the effectiveness of filling gaps in bad stands of cotton. Replanting the gaps in a bad stand did not increase the yield per acre ; there were, in fact, indications that this practice reduced yield per acre, the refills preventing plants of the original sowing from benefiting fully from the extra space available to them in a bad stand. It is concluded that no useful purpose is served by refilling gaps in poor stands of cotton with up to 40 per cent gaps.—P.M.

Hadfield, J. W. **Effect of sowing method on yield of linen flax.** *N. Z. J. Agric.* **75.** 177. 1947. **573**

During 1944-6 the Fields Division of the Dept. Agric. conducted trials in South Canterbury to determine the effect of the Holland coulter compared with that of a 7 in. drilling on yield of the linen flax crop and on fibre content of the straw. It is concluded that the Holland coulter has several advantages which include an even distribution of seed.—.M.H.

Jonge, L. J. A. de. Hennepteelt in Nederland. [**Hemp growing in the Netherlands.**] *Landb-VoorlDnst Med.* No. 37. 1944. pp. 28. [Received 1947] [Agric. Adviser for Fibre Crops ; Director, Netherlands Flax Inst., Wageningen] **574**

An illustrated booklet for the Dutch farmer gives information on the extent to which *Cannabis sativa* is grown in the Netherlands, a short description of the plant itself, and notes on the requisite type of soil and tillage, manurial treatment, place in the rotation, varieties, sowing time and method, care, diseases and pests, harvesting, yield and quality, and processing. Hemp can be grown after any crop. Any crop can follow it, although sugar and fodder beet are less suitable than others because of the occasional appearance of wireworms in hemp. It should not occupy the same land for more than 2 successive years. Although it is not of much importance in the Netherlands, some hundreds of farmers have been growing it in recent years, and the area, 1737 hectares in 1864 and practically *nil* by 1918, grew to over 100 hectares by 1941.—G.M.R.

Wraight, J. D. **Linseed and linen flax.** *N. Z. J. Agric.* **75.** 128. 1947. [Timaru] **575**

Both linen flax and linseed are successful crops on some of the arable lands of the South Island. For linen flax, whether on an old ley paddock on lighter land or on a stubble paddock of higher fertility, early cultivation is necessary and weeds should be cleared. Paddocks which have grown a stock feed should not be sown for linen flax, as excess nitrogen is not conducive to fibre quality. Linseed does not require exacting conditions and such paddocks are quite suitable, as are areas ploughed after clover. Varieties which have shown promise in the Fields Division trials are Bison, Walsh, and especially Golden Viking. These have outyielded varieties such as Rio and N. Z. Commercial.—M.H.

Sennitt, R. S. **Treatment and quality of cotton in the Belgian Congo.** *Emp. Cotton Gr. Rev.* **24.** 258-66. 1947. **576**

Since the cultivation of cotton began on a commercial scale in the Belgian Congo in 1921 there has been until recently only one variety of cotton, Big Boll Triumph, except for a small isolated area in the Kivu zone where Morogoro 998 has been grown. Regular analysis at the three Cotton Experiment Stations of the Institut National pour l'Etude Agronomique du Congo Belge (INEAC) for halo length of fibre, per cent fibre, seed index, per cent healthy seeds, per cent empty or aborted seeds, and per cent germination, has meant that a check has been kept on any signs of deterioration. Several years of selection by INEAC showed that it was not possible to improve the Triumph length of staple which was not more than $\frac{15}{16}$ in. in the north and from $\frac{7}{8}$ in. to $\frac{29}{32}$ in. in the south. However three new varieties have been produced—the Stoneville which has from 10-15 per cent higher yield of seed cotton, Gar with about 5 per cent higher yield than Triumph and 14-125 which is an exceptionally high-yielding cotton, estimated at from 30-40 per cent higher than Morogoro 998. The replacement of Triumph by Stoneville in the north and Gar in the south has already begun ; 14-125 replaced Morogoro 998 last season in the Kivu.

To obtain the most advantageous prices on the cotton market there have been attempts to improve the quality of the cotton crop. Methods adopted were care in picking in the field, sorting and cleaning the seed cotton, drying the seed cotton, improved methods of buying at the markets and of storage and transport before ginning and of ginning itself.

Before the war the Congo cotton was classified in lots according to well-known types based on the American system of classification which consists of eight full main grades, but because the greater part of the Congo crop now falls into higher grades four new main grades have been established.

The characteristics for which Congo cotton is appreciated are its appearance, bright colour or "bloom," good grade, small loss or waste in spinning, as well as even and easy running in the mills There is also a regularity and consistency of quality from bale to bale in the various lots during the same season and also from one year to another which has given it a good name amongst the spinners.—G.M.H

Vicente, A. G. Plantación de esparto. [**Planting esparto grass** (*Stipa tenacissima*).] *Agricultura Madrid* **16.** 489. 1947. **57**

In reply to a correspondent wishing to establish a plantation of esparto, it is noted that this grass prefers calcareous and gypseous to clay soils, and does best with a south aspect. It is highly sensitive to cold in the first two years of growth, and the use of a nurse crop is advisable, especially in temperate climates. Establishment may be by means of sowing or planting, and directions are given for both processes. [See also *Herb. Abstr.* 13. Abs 1067. 1943.]—G.M.R.

Armstrong, S. F. **Flax variety trials, 1940-1944** *J. nat. Inst. agric. Bot.* **5.** 155-61. 1947. **578**

The trials were undertaken jointly by the N.I.A.B. and H. M. Norfolk Flax Establishment The Institute undertook the comparison of the field behaviour, crop yields, and yields of de-seeded straw of the following varieties : Liral Monarch (control), Liral Crown, Liral Prince and L 2 Stormont Gossamer. Owing to war-time difficulties, the number of trial centres varied from year to year, and it was not possible to replicate the varieties in many of them, but certain definite results were obtained.

There was evidence that Prince, Gossamer and Crown each gave a slightly higher yield of raw flax than Monarch, as well as a higher yield o de-seeded straw. Yields of seed showed that Gossamer produces much less seed than the other varieties. Other results were that L 26 Gossamer produces the longest straw and lodges more frequently than the other varieties, and Monarch produces the shortest and best standing straw.—P.M.

Cullen, J. C. **Flax variety trials 1940-1944. Th processing results.** *J. nat. Inst. agric. Bot.* 162-70. 1947. **57**

Processing results showed that for all trials i all years there is no overall superiority of one variety over any other. Within any one year Liral Crown shows greatest variation relative t other varieties, while between years, L 26 Gossamer shows greatest variation. This is indicative of th greater sensitivity of Gossamer to seasonal variations and of Liral Crown to variation between districts. Liral Prince and Liral Monarch maintai a more constant level.

In general, higher yields of scutched flax per re, are associated with higher percentages on op and de-seeded straw, with lower yields of utching rug to scutched flax.—P.M.

OSBACO, Aurora M. de. Linos "amargos." [" **Bitter " flax varieties.**] *Rev. Invest. agric., B. Aires* **1.** 241-2. 1947. [Inst. Fitotecnia, Min. Agric. Argentine Republic] **580**

Four varieties of *Linum usitatissimum* under udy for damping-off disease at the Tezanos Pinto xperiment Station, Entre Rios, Argentina, were verely attacked by locusts; but, while two arieties were entirely consumed, two, Querandi .A. and a variety selected by the Tezanos Pinto ation, remained practically intact. The same enomenon was exhibited in two subsequent owings, and was confirmed by tests in which the me four varieties were fed to caged locusts. A st in which the two repellent varieties alone were d to caged locusts resulted in Querandi M.A. eing taken first and then the Tezanos Pinto ariety. The two non-repellent varieties were ore susceptible to damping-off than the locust-epellent. The repellent varieties are described s " bitter " in analogy with the term " bitter aize," applied to a variety of *Zea mays* which is nmune to locust attack. [See also *Herb. Abstr.* 8. bs. 2057, and Bull. 36 Imp. Bur. Pastures Field rops, pp. 203-4.]—G.M.R.

RANE, J. C. **Kenaf—fiber-plant rival of jute.** *Econ. Bot.* **1.** 334-50. 1947. [Univ. Calif.] **581**

Kenaf, *Hibiscus cannabensis* L. appears to be dapted to wide variations in climatic and soil conitions. It does best on well-drained sandy loam ith a considerable quantity of humus, and from 0 to 25 inches of rainfall over a period of 4 to 5 onths. For fibre production the daily light eriod during the rainy season should be of 12½ ours duration. Maximum yields result by lanting at the beginning of the rainy season, and rilling in rows about 12 inches apart at the rate of 0 to 35 lb. of seed per acre. Highest quality fibre s produced by harvesting shortly after the plants egin to bloom. Yields vary, but with favourable oil and environmental conditions, production of rom 1000 to 3000 lb. of fibre per acre are obained.

Kenaf fibre can be used for the manufacture f gunny cloth or sacking, ropes and cordage, fishng nets, floor matting, etc. The seeds yield up to 0 per cent of oil which can be used for salads and ooking.—P.M.

ESSLER, L. E. **The effect of fertilizers on the chemical composition and quality of dew-retted hemp fiber.** *J. Amer. Soc. Agron.* **39.** 812-6. 1947. **582**

Nitrogen fertilizers increase the growth of hemp and give greater yields of dew-retted hemp fibre, but at the same time the quality may be inferior because the fibre is coarser and weaker. The same may be said of hemp fibre produced on soil high in nitrogen. The cellulose content of the fibre was significantly increased where the complete fertilizer was used; however, during retting the more liable secondary constituents tend to level off in concentration regardless of fertilizer treatment.—From Author's summary.

TEXAS Agricultural Experiment Station. Bull. No. 686. **Factors affecting the performance of mechanical cotton harvesters (stripper type), extractors and cleaners.** By *H. P. Smith, D. T. Killough*, and *D. L. Jones*. 1946. pp. 50. **583**

Many commonly grown varieties, selections and strains of cotton were tested for their varietal reaction to machine stripping, extracting and cleaning in an effort to obtain a high quality cotton. Considerable variation was noted in the performance of the stripper harvester according to the seasonal conditions, different cottons and varied locations. Severest losses due to machine stripping were caused by full, branching plants while small, compact plants were not badly affected. There was little difference in the percentage of burs and waste removed from machine-stripped and hand-snapped cotton and no significant difference in staple length as a result of harvesting method. The best varieties for machine stripping were those with firmly attached bolls, stormproof qualities and fluffy locks for good extraction.—M.E.E.

TEXAS Agricultural Experiment Station. Bull. 683. **Comparison of different methods of harvesting cotton.** By *H. P. Smith, J. T. Rouse, D. T. Killough* and *D. L. Jones*. 1946. pp.22. **584**

Four varieties of cotton differing widely in their fibre properties were selected for this study in which the harvesting methods of hand picking, hand snapping, machine stripping and machine picking were compared for their effects on spinning performance. Trials were conducted for the 3-year period 1943-45 and each variety was harvested by the four different methods. The highest percentage of motes and waste removed from the cotton in cleaning and ginning was found in samples which had been machine-picked. Fibre properties and classers staple length were not appreciably affected by the method of harvest, but hand picking produced significantly higher grade cotton than other harvesting methods. The most important difference revealed by the tests was the increase in picker and card waste from cotton which was roughly harvested in comparison with the product from hand picking and this was especially significant for the longer staple cottons such as Deltapine and Rogers Acala. This, however, had little effect on the quality of the yarn manufactured except for a slight grade reduction in appearance for the long fine-fibred cottons.—M.E.E.

ROCHES, C. Le coton et les fibres artificielles. [**Cotton and artificial fibres.**] *Cot. Fib. trop.* **1.** 50-4. 1946. **585**

BUI-XUAN-NHUAN. Technologie de la Ramie: de la plante à la fibre textile. [**Technology of ramie: the plant and the textile fibre.**] *Cot. Fib. trop.* **1.** 20-6. 1946. [Inst. de Recherches du Coton et des Textiles exotiques] **586**

The fibre is prepared from the bark of *Boehmeria* an oriental member of the Urticaceae. (In England it is known as China grass.) About a dozen shrubby species produce the fibre the most important of which are *B. nivea* of temperate and sub-tropical climates and *B. utilis* of tropical, even equatorial regions. The leaves of the former appear white being covered with hairs on the under surface; in the latter leaves are green and hairless.

The plant's requirements as regards climate, soil, tillage, manuring, method of planting, density of planting, weeding, irrigation (where there is a dry spell), and damage by wind, frost and insect pests are discussed. Length of life of the plantation varies; in China and Indo China *Boehmeria* gives normal yields only for 3 or 4 years, but in Argentine the plantation lasts 20 to 30 years. Theoretically the plantation should go on for ever because new plants are produced by rhizomes. Harvesting of the stems is carried out before flowering in order to have a more workable fibre. In mature plants, two or three, or even five or six cuts per year are taken. *B. utilis* gives higher yields than *B. nivea*, but the fibres of the latter are of greater value.—D.B.

SENN, E. La guerre et le coton. [**The war and cotton.**] *Cot. Fib. trop.* **1.** 3-10. 1946. [Inst. de Recherches du Coton et des Textiles exotiques] **587**

The crisis caused by over-production and under-consumption of cotton had already reached its height before the war of 1939-45. The United States was about to call an international conference to study the lack of equilibrium between cotton growing and cotton manufacture. After the war, countries which produced and exported large quantities of cotton (U.S.A., Egypt, India, Brazil) were the ones which emerged as creditor countries while the great cotton importing countries (Great Britain, Italy, Germany, Japan) either emerged as debtor countries or were completely ruined in their economy. War-time and post-war production of raw cotton and of manufactured goods is reviewed for the countries named above. —D.B.

MACDONALD, D., FIELDING, W. L., and RUSTON D. F. **Experimental methods with cotton. II Sulphuric acid treatment of cotton seed, and it effects on germination, development and yield** *J. agric. Sci.* **37.** 291-6. 1947. **58**

In 1936, Christidis, working in Greece, con cluded that the use of cotton seed treated with sul phuric acid was not justified, since no practical ad vantage attached to it could be definitely estab lished. In view of these doubts, experiments wer carried out at Barberton in the 1938-9 and th 1939-40 seasons in an attempt to provide concret proof of the advantages which it was believed re sulted from it. Stand counts made soon afte germination revealed definite benefits with aci treatment. Seedling emergence was considerabl earlier, and stands recorded at final counts showe advantages for the acid-treated seed. The benefi of acid treatment was shown to be greater, too, wit poor samples of seed than with good, and with th smaller seed rate than with the greater. In th 1938-9 season, green weight samples were taken a three stages during growth and daily flow counts were made during the flowering period data showed the advantage of acid treatment to b continuous throughout growth. The experiment have shown that, for South African condition acid treatment of cotton seed has definitely led t an increase in yield.—P.M.

DANSK FRØAVL. Frøudbyttet af Spindhør. [**See yield of fibre flax.**] *Dansk Frøavl* **30.** 12 1947. **58**

At the Danish State Experiment Stations a Lyngby, Aarslev and Blangsted, which have cla soil, and on marshy soil at Ribe during the perio 1940-46 pulling trials were carried out with fib flax Stormont Cirrus, in which 6 pulling dates we tested. The dates and average yield of seed we as follows:

	kg.
18 July	540
25 July	730
1 August	810
8 August	800
15 August	730
22 August	620

Thus the seed yield rises up to the third pullin date, after which it decreases owing to sheddin of seed.—R.P.J.

PEARSON, E. O. **Possibilities of increased cotto production in East Africa. 6. Insect pests as factor affecting large-scale cotton growing Africa.** *Emp. Cotton Gr. Rev.* **24.** 244-5 1947. **5**

Increased cotton growing in Africa would mea an increased density of cotton in certain areas a the substitution of large blocks of the crop for t sent scattered and irregular units often arated by tracts of bush grassland or other ps. There would be an increase in the serious ngers associated with bad field sanitation and ubles like stand-over or abandoned cotton and reased weed hosts. But any such disadvantages uld be infinitely more than offset by the opporities given by large-scale cultivation for proper ntrol measures. See *Fld Crop Abstr.* 1. Abst. 3 and 2 Abst. 569—G.M.H.

INWATER, C. F., and BONDY, F. F. **New insecticides to control boll weevil and cotton aphid.** *J. econ. Ent.* **40.** 371-3. 1947. [USDA Agr. Res. Adm., Bur. of Ent. and Plant Quar.] **591**

Experiments were conducted at Florence, uth Carolina to compare the effect of several ecticides and combinations of insecticides ainst the boll weevil and the cotton aphid: nzene hexachloride gave almost complete aphid ntrol at strengths from 1 to 5.75 per cent of the nma isomer when mixed with an inert diluent or th DDT. For boll weevil control, benzene xachloride at strengths of 1.0 to 5.75 per cent of e gamma isomer compared favourably with lcium arsenate. DDT seemed to be very omising for the control of many cotton insects. om the standpoint of increased yields, 50 per nt DDT was the best material used.—From thors' summary.

NCOLN, C. and ISELY, D. **Corn as a trap crop for the cotton bollworm.** *J. econ. Ent.* **40.** 437-8. 1947. [Univ. of Ark.] **592**

Corn in silk attracted moths of the cotton bollrm from cotton during a bollworm outbreak in kansas in 1946. In all instances of severe injury freshly silking corn was in the vicinity of the ured fields at the time when the infestation gan. Dry, hot weather, which shortens silking pears to favour bollworm outbreaks.—P.M.

INES, J. C. **Comparison of insecticides for cotton insect control and the effect of copper on yields.** *J. econ. Ent.* **40.** 434-6. 1947. [Texas A. and M.Coll., Coll. Sta.] **593**

Basic copper arsenate used 1 year was effective ainst the bollworm and gave the highest increase yields. Copper as a dust increased yields an erage of 16 per cent in the experiments conducted ring 1942 and 1946. These increased yields sulting from the use of copper are regarded as ing due, at least in part, to the stimulating tion of the copper upon the plant, but the possible nefit of copper as a fungicide cannot be overoked. Lead arsenate proved to be almost as ective as calcium arsenate when used against avy infestations of weevils and was more effecve against the bollworm. The benzene hexaloride-inert mixture containing 5.75 per cent gamma isomer was effective against the weevil and prevented aphid increases, but permitted increased bollworm injury.—Author's summary.

NEWHOOK, F. J. **The detection of browning** (*Polyspora lini*) **and wilt** (*Fusarium lini*) **in seedlines of linen flax.** *N. Z. J. Sci. Tech.* **29.** Sect. A. 44-8. 1947. **594**

Details of tests for seed-borne browning are described and compared. By a new technique, described, the masking and inhibiting effect of saprophytes in the seed sample is largely eliminated.

A description is given of a new technique for the detection of seed-borne *Fusarium lini* by means of which large numbers of seeds can conveniently be tested and in which selective growth of the fungi present on the flax-seed is obtained.—From Author's summary.

BOATNER, Charlotte H., HALL, Catherine M., ROLLINS, Mary L., and CASTILLON, Leah E. **Pigment glands of cottonseed. II. Nature and properties of gland walls.** *Bot. Gaz.* **108.** 484-94. 1947. [Southern Reg. Res. Lab., New Orleans, La.] **595**

Gossypol, the pigment of the seed of cotton, occurs in glands which are relatively large in size (diameter 100-400*u*), spherical or ovoid in shape, and profusely distributed over the cotyledons and hypocotyls. The water-sensitive gland wall, which first appears in the 15-day old embryo, is preceeded by a layer of protective cells. Gossypol is first detected in the 15 to 18-day embryo after the gland wall has been formed, and once synthesis has begun the pigment increases rapidly in quantity.

The gland walls consist of five to eight relatively thick, almost colourless cells resembling curved plates of irregular shape, and composed of cellulose impregnated with pectin and hemicellulose and encrusted with cutin. The chemical nature of the gland wall has been investigated. The reaction of the plant to solvents is tabulated. Though stable to many reagents (a list of which is given), the glands are immediately ruptured by water. The contents stream out as finely divided suspended particles exhibiting lively Brownian movement.—D.B.

MIEGE, J. Observations et particularités de la floraison du cotonnier à Bouake (Côte d'Ivoire). [**Observations and peculiarities in the flowering of cotton at Bouake (Ivory Coast).**] *Cot. Fib. trop.* **1.** 11-9. 1946. **596**

A single variety of cotton exhibits striking variation in size of flower. *Gossypium barbadense* was investigated to discover variations in size of flower with season and correlation between weight of petal and climatic factors. Size of bracts relative to that of petals was investigated, also extent of colour on the narrow portion of the petals and position of flower, i.e. the branch on which the first flower occurred. Since *Gossypium* exhibits heterostylie measurements were made of length of the style above the staminal column.

Normally, *Gossypium* is self pollinated, but the possibility of cross pollination cannot be excluded and accidental hybridization is the cause of the rapid loss of purity in cultivated varieties. Hybridization is restricted if varieties are grown at a distance of 20 to 30 m. but is still possible at a distance of 500 m. and more frequent in the path of the prevailing winds.—D.B.

ROLLINS, Mary L. **Photomicrographic comparison of milkweed bast and cotton lint in relation to cell-wall structure of other natural cellulose fibres.** *Bot. Gaz.* **108.** 495-510. 1947. [Southern Reg. Res. Lab., New Orleans, La.] **597**

Giant milkweed (*Asclepias syriaca*) is one of the plants which rose to prominence as a source of substitute fibre during the war-time scarcity. Though widely different morphologically, there is a close resemblance in structure and behaviour of the bast fibres of *Asclepias* and *Gossypium.*

The twenty-seven photomicrographs presented with the text show the general similarity of these two different plant cells and establish the facts that the cell wall consists of " (a) an outer sheath, which is hardly capable of any appreciable swelling ; (b) a many-layered cellulose wall which may be swelled ten to twenty times its original size before solvation ; and (c) an inner canal inclosed by a lumen wall which in its reactions is more like the outer membrane of the fibre than it is like the secondary-wall layers. The fibre sheath appears to have a banded structure when not ruptured by swelling of the cellulose beneath it. In addition to confirming previous observations, these photomicrographs indicate that the cell-wall layers of the secondary wall in both seed hairs of cotton and milkweed bast fibers are discrete membranes readily separable one from the other by swelling reagents."—D.B.

FRANKENA, H. J. De invloed van het weer op de opbrengst aan lint en zaad bij vlas. [**The influence of the weather on yield of lint and seed in flax.**] *Landbouwk. Tijdschr.* **58.** 256-69. 1946. [Received 1947.] [Cent. Inst. Landbouwk. Onderzoek, Wageningen] **598**

Yields of *Linum usitatissimum* obtained in the Netherlands from 1903 to 1932 were studied in conjunction with the official records of temperature, cloud, rainfall and number of rainy days in three representative flax-growing localities during the months March to July of the same years. The results give only an approximate indication of the influence of weather upon yield, because the microclimate of the plant itself is not represented in the meteorological records consulted, which are readings taken above the height of the crops.

The principal areas of cultivation are t
provinces of Zeeland and Groningen, where whit
flowering and some selected indigenous blu
flowering flax is grown, and the province of Frie
land, where the indigenous white-flowering fl
is predominant. Linseed growing is seconda
only and is more important in the white-floweri
varieties.

The influence of the weather in the differe
months on yield of lint and seed respectively
discussed for each of the three flax-growi
provinces separately and illustrated by grap
For lint production approximately the same perio
are of importance in all three regions, first t
period before the sowing of the plants, whi
should not be wet, and secondly, with spec
reference to atmospheric humidity, the month
July. The intermediate periods are decisi
whenever extreme conditions are present, such
for example, heat and drought in May or Ju
which can completely ruin lint yield. For linse
growing, on the other hand, the periods which a
more or less critical differ in the three provinc
They are in Groningen May, which must be wa
and dry ; in Friesland July, when high relati
humidity is undesirable, and April, when rainf
should be preferably below normal ; and
Zeeland July, which should have dry atmosphe
conditions with little cloud and few rainy da
A dry April also favours linseed growing in t
province.—G.M.R.

ROBERTY, G. Nomenclature et taxonomie d
cotonniers cultivés. [**Nomenclature and ta
onomy of cultivated cotton species.**] *Cot. F
trop.* **1.** 47-9. 1946. [Montpellier, Franc
5

The proposed classification allows three sectio
in *Gossypium* species of the new world and one
the old world. Section *fruticosa* consists
species with a continuous cuticle over the epicar
it includes the two North American species
hirsutum and *G. latifolium.* Section *insculpta* h
fruits with a porous epicarp and free seeds ;
includes *G. barbadense* of the Antilles and *G. per
ianum* of Peru. Section *coarctata* has unit
seeds ; it contains a single species, *G. lapide*
indigenous in the Amazon forest and now prese
in all equatorial forests of the old world. Secti
arborea has flat bracts and consists of *G. obt
folium, G. arboreum* and *G. eglandulosum* of Afri
India and China.—D.B.

SUGAR BEET

FREDGARDH, F. Årets sockerbetsodling och b
kampanj. Förhållandena i Skåne. [**Cultivat
of sugar beet in 1947. Conditions in Scan**
Lantm. Svenskt Land **31.** 924. 1947.

The area sown has declined by appr

ately 12 per cent (from 54,000 ha. to 47,000 ha.). he beets appear to be best in central Scania, and specially in the Jordberga district. In north-west cania the crop is thin, but on the islands it ppears to be satisfactory. It is computed that lthough the diminution in the area does not xceed 12 per cent the yield of sugar will be reduced y approximately 17 per cent. At Trelleborg actory it is estimated that the yield of beets will be bout 33,000 kg. per ha., but the sugar content is ow, scarcely 16 per cent.—R.P.J.

ULPIN, S. **Towards quicker sugar beet singling.** *J. Minist. Agric.* **54.** 21-4. 1947. [Norfolk Agric. Sta., Sprowston] **601**

here is information on mechanical bunching ethods, improvements in drill design, segmented eed (sugar-beet fruits may contain from one to ve seeds, and therefore they vary in size, weight nd shape; segmentation aims at producing raded seed containing a high proportion of single-eed units), and decorticated seed (an alternative to egmentation; natural seed is rubbed down to the orrect size by emery wheels).—M.H.

РМОШЕНКО, П. И. **О новом способе очистки сахарной свеклы.** *Сахар. Промышл.* 1947. *No.* 9. стр. 16-18.

ARMOŠENKO, P. I. [**A new method of cleaning sugar beet.**] *Sahar. Promyšl.* 1947. No. 9. pp. 16-8. **602**

n 1944 a new method for cleaning sugar beet was dopted. The tops were removed at the base of he leaf stalks and the apical buds were cut so that he diameter of the cut surface was not more than or 3 cm. Removal of the drying remains of the eaf stalks is not recommended. By this means he root is not damaged and an essential point is hat prolongation of the first growth period is uppressed while there is no stimulation for onset f the second period of growth.

There is indication that storing beet treated as bove prevents the onset of rotting and is a means f lowering the loss of sugar, in spite of the fact hat there is a greater percentage of root sprouting. Such sprouting leads to some loss of sugar, but on he other hand root decay is prevented.

It is estimated that there are losses amounting o 9 or 10 per cent of the root mass at different stages of storage, and also after planting, up to the time of seed harvest. The significance of this is discussed.—M.H.

МУРАВЬЕВ, В. П. **Борьба с потерями при полевом хранении сахарной свеклы.** *Сахар. Промыш.* 1947. *No.* 10. стр. 18-22.

MURAVJEV, V. P. [**Measures to prevent loss when storing sugar beet in the field.**] *Sahar. Promyš.* 1947. No. 10. pp. 18-22. **603**

The need for producing high yields of sugar beet crops on large areas is important, but constitutes only half of the industry's problem. The other half concerns production of high sugar yields. There is discussion of the treatment of sugar beet (which treatment affects quality of the product supplied to the sugar factory) between the periods of harvesting and field storage, namely, (1) uprooting; (2) cutting the clusters; (3) cleaning roots; (4) sorting; and (5) field storing.—M.H.

БЕЛЬСКИЙ, В. П. и СОБОЛОВ, Ф. С. **Особенности агротехники и химизации сахарной свеклы в условиях орошения.** [Смотри] *ВНИИСП*, *Научный Отчёт*, 1941-42. стр. 4-23. Москва, 1945.

BELJSKIĬ, V. P., and SOBOLOV, F. S. [**Agrotechnical and chemical characteristics of sugar beet under irrigation.**] [Contained in] *VNIISP*, *Nauč. Otčët*, 1941-42. pp. 4-23. Moscow, 1945. [All-Union Sci. Res. Inst. Beet Husbandry] **604**

In Transcaucasia, southern Kazahstan, Kirgiz and other regions where irrigated sugar beet sowings have a long vegetative period, agrotechnical measures recommended include: an early autumn ploughing (beginning of Sept.) for subsequent spring sowings; and the sowing of annual legumes for green manure (to take the place of a nitrogenous mineral fertilizer and farm manure which is lacking). *Lathyrus*, *Vicia* and fodder peas are suitable, and each kolhoz should grow its own seed for green manure plants. Thus 1 ha. of sown *Lathyrus* produces seed to sow about 15 ha. for green manure, and 1 ha. of *Vicia* or fodder peas will produce seed for 10 ha. green manure. Details are given of suitable fertilizers in relation to irrigation for different soil types.—M.H.

МЕЛЬНИК, М. К. **О введении в свеклосовхозах травопольной системы земледелия.** *Сахар. Промыш.* 1947. *No.* 8. стр. 40-4.

MELJNIK, M. K. [**Introduction of a herbage rotation into beet sovhozes**] *Sahar. Promyš.* 1947. No. 8. pp. 40-4. **605**

The All-Union Scientific Research Institute of the Sugar Industry has made investigations which show that inclusion of a herbage rotation in the new areas of beet sowings secures the highest crop yields. Herbage rotations have been studied at the Stony Steppe State Selection Station (situated in the Talovsk district of the Voronež Province, and founded 55 years ago by V. V. Dukučaev). A system of agrotechnical measures for dry areas, evolved at the Station and known as the Dokučaev-Viljjams complex, includes fallows and herbage in the rotation, and also the construction of shelter belts. The rotations for beet sovhozes most commonly used are the 8 and 7-course variants, and the seeds mixture in the herbage break should be sown under spring wheat in preference to winter wheat. Further, in choosing components for the herbage mixture, local conditions should be studied. For example, in a clover mixture for southern areas, *Festuca pratensis* is more adapted to the unfavourable climatic conditions than *Phleum pratense*, and in a lucerne mixture, French ryegrass is recommended instead of *Agropyron* sp.

It is anticipated that the introduction of a herbage rotation in beet sovhozes will be completed during the period 1947-8.—M.H.

БУНИН, В. Н. Агротехнические приемы возделывания сахарной свеклы в северных и северо-восточных районах. [Смотри] *ВНИИСП*, *Научный Отчёт*, 1941-42. стр. 23-37. Москва, 1945.

BUNIN, V. N. [**Agrotechnical measures for sugar beet in northern and north-eastern regions.**] [Contained in] *VNIISP*, *Nauč. Otčët*, 1941-42. pp. 23-37. Moscow, 1945. [All-Union Sci. Res. Inst. Beet Husbandry] **606**

The eastern and northern regions of USSR differ greatly in their natural and economic conditions from those of the areas in which beet is usually grown. The study of new regions for beet began in 1928 and concerned southern, south-eastern and the more southerly parts of the north-eastern areas. In 1933 these studies were extended to the north and north-east, and between 1933 and 1937 mass sowings were made but little attention was given to agrotechnical methods. In 1938 the northern sowings were discontinued, but received further attention after the outbreak of war. The above Institute established research centres and many kolhozes in the following places : Irkutsk, Baškir, Kazah, Čuvaš, Kirov, Vologod, Šortandinsk, Šadrinsk, Novosibirsk, Gorjkov, Čeljabinsk and Mordovsk.

Data from tests made include the following items : (1) Development of beet in the non-chernozem zone (and where temperature in spring is lower) is less satisfactory than that in the black-soil areas. Yields above 300 c. per ha. are obtained on grey forest soils, but on medium podzols and strong podzols yields are barely 100 c. per ha. (2) The data for peat soils require confirmation. (3) Early sowings are essential for high yields, but extremely early sowings result in a high percentage of bolting. (4) Moistening and vernalization of seed for early sowings accelerate seedling emergence by 2 to 4 days but do not increase root yield. Such treatment is beneficial for yields of later sowings, and only for early sowings when the spring is late and warm. (5) Transplanting extends the vegetative period of beet, facilitates control of pests and frost damage, but results in a greater percentage of branching roots. (6) In non-chernozems and stiff leached chernozems, inter-row cultivation increases yields by more than 50 c. per ha. The depth of cultivation should be between 7 and 12 cm., depending on the soil. (7) Farm manure and mineral fertilizers on non-chernozems result in yield increases from 37 to 86 c. per ha.—M.H.

ГОРШКОВ, П. А. Культура сахарной свеклы в юго-восточных районах. [Смотри] *ВНИИСП*, *Научный Отчёт*, 1941-2. стр. 37-50. Москва, 1945.

GORŠKOV, P. A. [**Sugar beet in south-eastern regions of USSR.**] [Contained in] *VNIISP*, *Nauč. Otčët.* 1941-42. pp. 37-50. Moscow, 1945. **607**

Study of agrotechnical measures for sugar beet was not systematic before 1930 in the south-east USSR. From 1930 experimental work ceased and was resumed only in 1942. In this region the average summer precipitation is 120-161 mm (June, July, August). In the autumn (Sept.-Oct.) there are 104-7 mm. ; in winter (Dec. to Feb.) 46-69 mm. ; and in spring 72-8 mm. At the time of the greatest intensity of growth in sugar beet (May to Sept.) the rainfall is on an average 190-238 mm., that is, 50 to 60 per cent of the annual amount, but this rapidly evaporates during periods of anticyclones and measures should be taken to conserve the autumn and winter rainfall. A characteristic trait of the climate in the south-east is the rapid rise in air temperature in spring which quickly dries out the upper soil layers. There is also a predisposition to formation of mist. Such conditions constitute a menace to seedlings of sugar beet. In 1942 under the direction of the above Institute and in collaboration with the Saratov Inst. of Grain Husbandry, experiments were initiated at Balašov, Krasnokut, Bezenčuk, and Baluĭsk. The data obtained include the following: deep ploughing is beneficial under conditions of the south-east, and this benefit is enhanced by farm manure and mineral fertilizers ; seed should be sown at a depth of 4 cm. and rolled. The merits of wheat, various legumes and potatoes, with and without fertilizers, as preliminary crops for beet growing are discussed.—M.H.

LILL, J. G. **Influence of crop sequence and fertilizers upon the sugar beet crop.** *Proc. Amer. Soc. Sug. Beet. Technol.* 4th Gen. Meeting, 1946. 54-63. **608**

Results obtained from experiments show that the success of the crop is influenced by crop-sequence and soil fertilization, but both factors operate independently in exerting their influence upon the sugar beet crop. Statistical analysis showed that the effect of crop sequence was slightly affected by soil fertilization only in respect yields : the two factors were independent of ch other in all other characteristics of the p. If the number of marketable roots obtained considered, then soybeans—grown for seed—d corn, favour the soil so as to obtain stands of et much higher than were obtained when sugar ets were preceded by either sugar beets or oats. here beets were grown after beets, the number of rketable roots and acre yields decreased.—

RMSTRONG, S. F. **Trials of sugar beet strains, 1941-43.** *J. nat. Inst. agric. Bot.* **5.** 138-54. 1947. **609**

The outbreak of war in 1939 interfered with e new series of trials in which a number of rman and Dutch strains were to be tested. By 41 it was decided to limit the strains to English own seeds. Trials were conducted at six centres, mely, in Somerset, Norfolk, Yorkshire, Fife-ire, Lincolnshire and Shropshire. Observations the various strains were :—

arpe's Kleinwanzleben E : This (control) strain ve consistently good results at all centres. It oduced the highest weight of roots and the ghest yield of sugar per acre. Resistance to lting was good.

hnson's Perfection (Type E) : This produced aller roots than the control and gave a lower erage tonnage per acre, but the sugar content s distinctly higher, and it possessed a very high sistance to bolting.

nnell's No. 22 : Average root yield was 96.75 r cent of the control, but the slightly lower gar content reduced its yield of sugar to 96.17 r cent of the control. It showed satisfactory sistance to bolting.

rton's C : Root yield averaged 96.80 per cent d sugar yield was 96.13 per cent of the control. esistance to bolting was fair.

ttle's E : This closely resembled the control, t its yield of roots and sugar were 5 per cent less.

arster's British Hilleshog : This strain had low ot weight combined with a sugar content which s the highest of any strains. It showed also, a gher resistance to bolting than any other strain.

ush E (formerly Buszcynski N.P.) : Root weight d yield were lower than the control, and sugar eld was 94.17 per cent of the control. The rain proved prone to bolt.

ritish S.K.W. : Yield of roots and the sugar ntent were lower than the control, the yield of gar being 8 per cent below.

leinwanzleben E : The tendency to bolt was gh.

oldsmith's Dobrovice : Average yield of roots as 10 per cent lower than the control and its eld of sugar lower than any other strain. It owed a high tendency to bolt.—P.M.

ОПАЦКИЙ, Л. В. Необходима настойчивая борьба за новые районы. *Сахар. Промыш.* 1947. *No.* 8. стр. 9-13.

OPACKIĬ, L. V. [**Persistent effort is required for new areas of crop production.**] *Sahar. Promyš.* 1947. No. 8. pp. 9-13. **610**

Doubts have been expressed regarding the advisability of extending beet sowings to the north and south-east regions in the USSR (notably by Ziljberman, in *Sahar. Promyš.* 1947, No. 1). The present work stresses the undesirability of crop industries being concentrated in limited areas. It is computed that in 1950 more than 68 per cent of sugar production will come from the Ukraine, and no other food crop is so concentrated in one region.

Following a review of attempts to grow sugar beet in Britain, Finland and Sweden (in latitudes ranging as far north as 60°) it is noted that in these countries temperature range and total amounts are similar to that in the European parts of RSFSR (Russian Socialist Federated Soviet Republic). For example, in the areas of Ivanovo, Kostroma and Gorjkiĭ the length of the period with a temperature above 10° is 127-135 days, and there is a total temperature of 1900-2200°. In south-west Sweden the length of the period with a temperature above 10° is 126-144 days and there is a total temperature of 1800-2100°. In Finland there are beet sowings where these recordings are 116-121 days and 1700° respectively.

From a discussion of the conditions in other areas (Kazah, Baškir, etc.) it is concluded that the possibility of extending sugar beet sowings is much more promising than Ziljberman maintains, that selection work should be expedited to develop varieties with a short vegetative period and good resistance to drought, and that mechanization should be developed to obviate labour problems in the new regions.—M.H.

САНОЦКАЯ, Е. И. Селекция сахарной свеклы в новых районах свеклосеяния. [Смотри] *ВНИИСП, Научный Отчѐт*, 1941-42. стр. 86-101, Москва, 1945.

SANOCKAJA, E. I. [**Selection of sugar beet for new districts of beet sowings.**] [Contained in] *VNIISP, Nauč. Otčët,* 1941-42. pp. 86-101. Moscow, 1945. **611**

At the present time sugar beet sowings in USSR are being extended, but in selection work the composition of varieties in relation to agrotechnical measures has hitherto received little attention. Effort has been centred in the selection of universal varieties which will remain stable under all conditions. Beets from different sources react differently to changes in ecological conditions. Studies from the ecological aspect in progress by the stations of the All-Union Sugar Institute for 5 years before the war have shown some unexpected results. For example, varieties produced in the Ukraine successfully competed in new regions with the local varieties. Observations made on the growth behaviour and composition of sugar beet sowings under irrigation (involving 8 and 5 waterings, the latter resulting in the sharpest fluctuation between periods of moisture and dryness) have been utilized in studying biological groups of this crop. The varieties I-1530 and R-1537 comprised the material of the tests. The latter is more productive under irrigation than the former.—M.H.

SUGAR BEET JOURNAL. **Interest is high in new "peg-top" beet.** *Sug. Beet J.* **14.** 37. 1948. **612**

A new variety of sugar beet has been developed by G. W. Deming, agronomist of the U. S. Department of Agriculture at Fort Collins, Colorado. The variety is the fourth generation selection from a cross between a red garden beet and the leaf spot-resistant sugar beet U.S. 200 × 215. The bulk of the weight of the new variety is near the top as compared with the conventional beet. It has a high tonnage, is moderately sweet and is 'streamlined' for harvesting. More research will be necessary to determine if the variety will be commercially successful. The research is part of the programme under Dr. G. H. Koons, U.S.D.A., pathologist. "Even if the variety is not released it will be used to cross with leaf spot and curly top resistant types, thereby greatly shortening the time for a variety suited for mechanized harvest as well as being disease resistant, to be introduced."—P.M.

ДЯТЛОВ, И. Г. Механизация посева свеклы, зерновых культур и высева минеральных удобрений. [Смотри] *ВНИИСП*, *Научный Отчёт*, 1941-42. стр. 162-71. Москва, 1945.

DJATLOV, I. G. [**Mechanization of beet and grain sowings, and distribution of mineral fertilizers.**] [Contained in] *VNIISP*, *Nauč. Otčět*, 1941-42. pp. 162-71. Moscow, 1945. **613**

Work on the construction of beet seeding machines was started by the All-Union Scientific Research Institute of Sugar Industry (VNIISP) in 1936. Experiments at the Kirgiz Station indicated that for irrigated areas a distance of 600 mm. between the rows has several advantages, and during 1938-9 a machine (TS-5Š) designed for sowing at this distance was recommended for mass beet sowings. It includes an original gadget with calibrated appertures which reduces unequal sowings from 8-10 per cent to 2-3 per cent.

Different types of combine sowing implements are described and illustrated.—M.H.

ENGLAND AND WALES, Ministry of Agriculture an Fisheries. Agriculture Overseas. Rep. No. **Mechanization of the sugar beet harvest in Nort America.** 1947. pp. 20. **61**

The Sugar Beet Mission visited U.S.A. t study the state of mechanization of the sugar bee crop. Particular attention was paid to harvestin and experimental work with harvesting machiner The report deals with the state of harvest mechar ization, comparisons of costs of harvesting by han and by machine, types of sugar beet harvesters an mechanical loaders, and the application of America practices to British conditions. Research an development is being carried out in four ways, b the manufacturers of machinery, by individu farmer enthusiasts, by Universities and Stat Colleges and by the U.S.D.A. Methods were di ferent in each case, but the four groups were c operating. The report is illustrated with 24 phot graphs of soil conditions and harvesting machiner —P.M.

EBBESEN, E. Sukkerroeaffaldets Opbevarin [**Storage of sugar beet residue.**] *Ugeskr. Landn* **92.** 619-20. 1947. **61**

The sugar beet residue returned to growe from the sugar factories amounts to approximatel 55 per cent of the weight of roots delivered. Thu in 1946 farmers received about 0.7 million tor residue corresponding in round figures to 55 millio fodder units.

With careless storage, losses may amount t 50 per cent or more, but they can be restricted t 25 per cent or less by the adoption of comparativel simple measures.

The residue should be stored in cement cor tainers or in well-constructed earth pits with a outlet. The material should be well trodden dow during filling, and should be covered as soon a possible with chaff and a layer of soil.

In the 7 months from January 1st to Augu 1st the average loss of dry matter is approximatel 3 per cent per month, while from August 1st to No ember 1st it is about 8 per cent per month.—R.P.

ПЕТЕРСЕН, П. П. Организация колхозно семеноводства сахарной свеклы в новых райо нах свеклосеяния. [Смотри] *ВНИИСП*, *На чный Отчёт*, 1941-42. стр. 172-91. Москв 1945.

PETERSEN, P. P. [**Organization of sugar beet se production in new regions of beet sowings** [Contained in] *VNIISP*, *Nauč. Otčět*, 1941-4 pp. 172-91. Moscow, 1945. **61**

Up to the time of the recent war sugar be was produced chiefly in European parts of USS namely, in the Kiev, Voronež and Kursk region It is now desired to produce sugar beet seed in ne centres, the irrigated districts of Kirgiz, Kazahsta and Uzbekistan with the co-operation of the ko ozes. Beet sowings in Kirgiz began only in 1930, and an average root yield in 1940 was 400 c. per ha. The object of producing seed in Kirgiz is to supply material not only for the new areas but also to restore the devastated areas in the Ukraine and elsewhere. The economic aspects of developing new areas are discussed in regard to location of factories and working capacity of the population in different kolhozes.—M.H.

VISSER, R. H. Periodiek gewasonderzoek in verband met de voedselopname en de weersomstandigheden. [**The periodic analysis of plants in relation to food absorption and weather conditions.**] *Landbouwk. Tijdschr.* **59.** 266-8. [English summary, p. 268.] 1947. **617**

Summary of an address presented to the Netherlands Agricultural Society's Study Circle for Phenology. Chemical analyses were made of sugar beet (*Beta vulgaris*) grown for seed in light clay and heavy clay respectively, in 1942, 1943 and 1944. The samples for analysis were taken 8 times in each year during the growth of the plants. The figures obtained threw light upon manurial requirements, the translocation of materials in the plant, and the effect of weather conditions. The best yields are obtained in warm, dry weather. A normal crop absorbs, per hectare, approximately 200 kg. nitrogen (which should be given early), 50 kg. phosphoric acid (early application again advisable), and 500 kg. potassium.—G.M.R.

ПЕТЕРБУРГСКИЙ, А. В. Еще о культуре сахарной свеклы из сегментированных семян. *Сахар. Промыш.* 1947. *No.* 5. стр. 37-40.

PETERBURGSKIĬ, A. V. [**Further information on sugar beet crops from segmented seed.**] *Sahar. Promyš.* 1947. No. 5. pp. 37-40. **618**

The author has made tests extending over 2 years on questions of sugar beet production from mono-germ seeds. Laboratory experiments with segmented seeds show that such seeds absorb less water vapour than do germinating seed clusters. This should lessen storage problems, but prolonged storage of segmented seeds is undesirable because their energy of respiration, and therefore viability, is lower. There is also indication that portions of the seed coat removed by segmentation contain some substance which hinders seedling emergence. Water extracts of substances composing the seed coat always have a restricting effect on germination. It is therefore assumed that removal of the seed coat facilitates germination of beet seed, although it is maintained that this has little practical significance, because in the process of swelling of the clusters in field sowings these substances are absorbed by the soil. It has also been determined that the ferment invertase is chiefly located in the seed coat, but the significance of this has not been elucidated.

The following results are among data obtained from field sowings with segmented seed and control plots of unsegmented seed: (1) sowings of segmented seed can be less dense than those of controls; (2) root yields from controls are 235.95 c. per ha. and 241.77 from segmented seeds; (3) sugar yields from controls are 38.59 c. per ha. and 39.39 from segmented seed. It is concluded that sowings of segmented seed are generally practicable under normal conditions in USSR.—M.H.

MURRE, M. Onderzoek op het bietenaaltje. [**Investigations relating to eelworm infestation.**] *Maandbl. LandbVoorlDnst* **4.** 436-8. 1947. [Crop Husbandry Asst., Zierikzee] **619**

Infestation by the beet eelworm [*Heterodera schachtii*] has very seriously increased in the Netherlands islands of Schouwen and Duiveland since 1941. Measures taken to determine the degree of spreading and to prevent further infestation are described, and it is noted that flooding during the war did not destroy the larvae.—G.M.R.

FIFE, J. M., and PRICE, C. **Sugar and nitrogen changes in topped sugar beets exposed to very high temperatures prevailing at harvest.** *J. Amer. Soc. Agron.* **39.** 327-34. 1947. [U. S. Dep. Agric., Riverside, Calif.] **620**

Harvest problems in the Imperial Valley, California are complicated by the very high temperatures that occur during June and July. In this area *Beta vulgaris* var. *rapa* are planted in autumn to utilize the mild winter and warm spring weather which is conducive to good growth, and therefore the plants are ready for harvest from May onwards. The present studies, conducted in 1944 and 1945, were planned with special attention to changes in harmful nitrogen, sugars and moisture contents of lifted topped beets exposed under field conditions to temperatures up to 120°F. Harmful nitrogen and soluble nitrogen increased during the first 2 days of drying. Sucrose and raffinose decreased steadily after the second day while the reducing sugars were correspondingly increased. The rate of loss in sucrose approximated 4.8 lb. per ton of fresh beets for each day of exposure; a loss unlikely to occur in other growing areas of the United States.—M.E.E.

ROOT CROPS

GREENWELL, Amy B. H. **Taro—with special reference to its culture and uses in Hawaii.** *Econ. Bot.* **1.** 276-89. 1947. **621**

The history of the Taro-root is reviewed and possibilities of future importance as a commercial food crop are discussed.—P.M.

FÖRSÖK OCH FORSKNING. Tillväxten hos rotfrukter. [**Growth in root crops.**] *Försök och Forskning* **4.** 112. 1947. **622**

Root crops make most vigorous growth in the autumn. In an 11-year trial at Ultuna the yield of swedes and turnips was almost doubled from 1 September to 29 September (from 30-35 tons per ha. to 50-60 tons per ha.) When the roots were left in the ground for another fortnight, the yield increased by approximately 6 tons per ha. During years when growth was not interrupted by frost and it was possible to postpone lifting for a further fortnight, that is until the end of October, the yield was increased by 4 to 5 tons per ha.—R.P.J.

NORSK LANDBRUK. Når det vatnes—[**When irrigation is carried out.**] *Norsk Landbr.* **13.** 478. 1947. **623**

According to the Ministry of Agriculture's last report on arable crops in Norway, the yield of swedes on the average for the 7 Østland counties was 51 per cent of that of an average year. On many farms it was considerably less than that figure. On irrigated land the yield of swedes was 7300 kg. roots and 2000 kg. tops per dekar. This corresponds to approximately 970 fodder units per dekar. The yield of fodder beets was 4000 kg. roots, and of hay 650 kg. per dekar (double the yield of hay on an adjacent meadow which had not been irrigated.)—R.P.J.

КЕДРОВ-ЗИХМАН, О. К. и КЕВОРКОВ, А. П. Действие доломитовой муки, в связи с применением бора, на урожай пропашных культур кормового севооборота. *Доклады Всесоюз. Акад. С.-Х. Наук* 1946. *No.* 1-2. стр. 3-6.

KEDROV-ZIHMAN, O. K. and KEVORKOV, A. P. [**Effect of dolomite meal in relation to boron application on yield of row crops in a forage crop rotation.**] *Doklady Vsesojuz. Akad. S.-H. Nauk* 1946. No. 1-2. pp. 3-6. **624**

Dolomite meal with boron is a beneficial fertilizer on calcareous soils. Root yield of fodder beet and yields of fodder cabbage are increased by these substances, but, as in the case of all lime fertilizers, the dolomite meal may lower the sugar content in the beet. Boron lessens this effect. To strengthen the fodder basis in the non-black soil zone of the USSR, measures for treating the acid podzols should be extended.—M.H.

UGESKRIFT FOR LANDMAEND. Tørstofindholdet i Rodfrugter i 1947. [**Content of dry matter in root crops (in Denmark) in 1947.**] *Ugeskr. Landmn.* **92.** 763. 1947. **625**

On the basis of results of investigations of 4924 root samples collected by the Director of Lyngby State Research Station from various parts of Denmark in 1947 the average dry matter percentage in root crops was as follows :

	The Islands	*Jutland*
Swedes, Bangholm	13.2	13.3
do., Wilhelmsburger	11.9	12.5
Barres, Strynø and Ferritslev	13.0	12.8
Barres, Øtofte	16.2	15.0
Fodder sugar beet, Pajbjerg Korsroe	17.9	16.8
do. Yellow and white Øtofte	19.1	18.4
do. Pajbjerg Rex	20.2	19.0
Sugar beet for fodder	21.9	21.1
Turnips	18.8	—

Compared with the average for the five-year period 1942-46, the dry matter content in fodde beets in 1947 is about 1.5—3 per cent higher on th Islands, but only 0.1—1 per cent higher in Jutland. For the whole country the content i swedes is about 1.5 per cent higher than the average mentioned.—R.P.J.

PHYSIOLOGY

WEINMANN, H. **Determination of total availabl carbohydrates in plants.** *Plant Physiol.* **22** 279-80. 1947. [Univ. Witwatersrand, Johannesburg, S. Africa] **62**

The term " total available carbohydrate " includes all those carbohydrates which can be use as a source of energy or as building material either directly or indirectly after breakdown by enzymes. Those included in this definition ar usually sugars, fructosans, dextrin and starch, whil celluloses and hemicelluloses are excluded. A new estimation is described here in which air-dried ground samples of plant tissue are digested with takadiastase, whereby starch, dextrin and maltose are broken down to glucose and other sugars and fructosans are simultaneously extracted. Afte clarification, all the sugars are converted into hexoses by acid hydrolysis and the reducing powe of the neutralised hydrolysate determined. Digestion of most plant carbohydrates is complete bu the method is not applicable to inulin. Th values obtained by this method were higher than the combined amounts of sugars, fructosans dextrins and starch when estimated separately a glucose. The reducing power of the digests was however, almost entirely due to fermentabl sugars ; the higher values are not therefore due t digestion of hemicelluloses but are attributed t hydrolysis of other groups, for example, protein and glucosides not included in the more usua methods. The two series of values show a positiv correlation of very high significance. Results i general can be reproduced within 5 per cent.—O.N.P.

STUHLMAN, O., Jr. **A physical analysis of growth and structure of some grasses.** *Bull. Torrey bot. Cl.* **74.** 215-31. 1947. [Univ. North Carolina, Chapel Hill] **627**

This is a study of growth by a physicist. Changes in length, volume, and mass, and variations in the elastic constants which result from changes in internal stresses are expressed in graphs. Grasses investigated were *Sorghum halepense*, *Arundo donax*, *Arundinaria macrosperma* and *Bambusa*. The position of the internodes along the stem reflects the growth-in-time history of the plant. The appearance of a branch or bud at a node depressed the rate of growth causing local changes in the slope of the growth curve and locally changed the elastic modulus. The modulus of elasticity of *Arundo donax* was found to be about a million pounds per square inch, comparable to that of white cedar. "Southern industries are probably not aware of the economic value and strength of this material."—D.B.

FUNKE, L. G. Verschillende aspecten van bloei onder invloed van de photoperiode. [**Various aspects of flowering under photoperiodic action.**] *Ned. kruidk. Arch.* **54.** 29. 1947. **628**

Plants were subjected to 3-hour short day, in some cases supplemented with a number of hours of red or blue light. The intensity of the light had little effect, but the quality produced reaction. Four groups of plants were distinguished: (1) plants on which red light has the same effect as white light and blue light the same effect as darkness; (2) plants on which both red and blue light has the same effect as darkness; (3) plants on which both red and blue light has the same effect as light; (4) plants on which blue light has the effect of light, red light that of darkness. There are transitions between these groups. It is possible to induce earlier flowering in a "short-day plant" through short-day treatment, for example, 7 days of only 8 hours' light. This condition is, however, reversible, because after flowering the flower stalk reverts to vegetative growth. If the plant is again left to normal daylength, the vegetative stem flowers once more in the autumn when the days grow shorter.—G.M.R.

SIVORI, E. M. Fotoperiodismo de *Chenopodium Quinoa* Willd. Reacción de la cigota y gametófito femenino. [**Photoperiodism in** *Chenopodium quinoa*. **Reaction of the zygote and female gametophyte.**] *Darwiniana* **7.** 541-51. [English summary, p. 551.] 1947. [Inst. Fitotéc. Santa Catalina, Univ. La Plata, Llavallol, Argentina] **629**

Chenopodium quinoa behaves as a short-day plant. This reaction is modified by temperature and the number of inductive photoperiods. As the number of short days increases and the temperature to which the plants are submitted rises, the time from the beginning of treatment to anthesis becomes shorter. A second period of sensitivity to the length of day has been determined in which the plant already in flower requires a period of short days in order to develop fruits. With the temperatures under which the present experiments were made, at least 9 short days before and 9 after anthesis are necessary. The effect of this second period is exercised not on the leaves, but directly on the flowers, where it becomes localized without transmitting itself to other flowers. Continuous light inhibits the development of the zygote and ovary and possibly that also of the female gametophyte, preventing the formation of a viable ovule.—G.M.R.

SCULLY, N. J., and DOMINGO, W. E. **Effect of duration and intensity of light upon flowering in several varieties and hybrids of castor bean.** *Bot. Gaz.* **108.** 556-70. 1947. [Bur. Plant Ind., U.S.D.A., Beltsville, Md.] **630**

Certain populations of castor bean (*Ricinus communis*) contain flowerless individuals. Failure to flower is a genetical character which appears in a definite percentage of the F_2 generation. The effect of photoperiod on the parents, F_1, and F_2 generations was investigated. The node position of the first flower and the total number of nodes on non-flowering plants were the criteria used for measuring responses of plants.

Plants of both parents and the F_1 progeny flowered at relatively low node positions (F_1 being intermediate between both parents) but of the F_2 plants 10 per cent remained vegetative, while 20 per cent were in the same category as regards position of first flowering node as were the parents and F_1 generations.

"Flowerless F_2 plants remained vegetative when grown with different photoperiods and when grafted either as stock or as scion with vegetative parent plants which subsequently were induced to flower."—D.B.

JONES, K. L. **Studies on Ambrosia. IV. Effects of short photoperiod and temperature on sex expression.** *Amer. J. Bot.* **34.** 371-7. 1947. [Univ. Michigan, Ann Arbor] **631**

Ambrosia trifida and the normal strain of *A. elatior* are monoecious in nature with pistillate flowers borne laterally in leaf axils and staminate flowers in terminal racemes. In 6-week old plants in which floral primordia were already developed short-day treatment (20 successive short days of 6 hours each) accelerated development of pistillate flowers but retarded that of staminate flowers. When plants were returned to normal photoperiod conditions pistillate flowers replaced staminate flowers in terminal inflorescences (some seed of which was viable) and many staminate buds aborted. These were after-effects of the short photoperiod.

The temperature effect during the dark period (a carton light shield was used) was investigated. —D.B.

PLANT BIOCHEMISTRY

LUNDEGÅRDH, H. **Mineral nutrition of plants.** *Ann. Rev. Biochem.* **16.** 503-28. 1947. [Inst. Plant Physiol. Uppsala, Sweden] **632**

SKOOG, F. **Growth substances in higher plants.** *Ann. Rev. Biochem.* **16.** 529-64. 1947. [Dept. Bot., Univ. Wisconsin, Madison, Wis.] **633**

STEWARD, F. C., and STREET, H. E. **The nitrogenous constituents of plants.** *Ann. Rev. Biochem.* **16.** 471-502. 1947. [Dept. Bot., Univ. Rochester, N.Y. (F.C.S.), and Dept. Bot., Univ. Coll. Nottingham, England (H.E.S.)] **634**

DESIKACHAR, H. S. R., and DE, S. S. **The cystine and methionine contents of common Indian foodstuffs.** *Curr. Sci.* **16.** 284. 1947. [Indian Inst. of Sci., Bangalore] **635**

Protein, cystine and methionine contents are given for the cereals *Oryza sativa*, *Eleucine coracana*, *Sorghum vulgare* and *Triticum vulgare* for pulses including species of *Cicer*, *Phaseolus*, *Cajanus*, *Dolichos* and *Vigna*, and for oilseed cakes obtained from *Arachis hypogea*, *Glycine hispida*, *Sesamum indicum*, *Gossypium barbadens* and *Cocos nucifera*. Rice contains a high percentage of methionine and if the amino-acid contents are expressed as a percentage of the protein content, the cereals are the best sources of methionine while the pulses and the oilseed cakes constitute the richest sources of cystine.—M.E.E.

VIRTANEN, A. I., JORMA, J., LINKOLA, H., and LINNASALMI, A. **On the relation between nitrogen fixation and leghaemoglobin content of leguminous root nodules.** *Acta chem. Scand.* **1.** 90-111. 1947. [Biochem. Inst., Helsinki, Finland] **636**

Two kinds of nodules are known to occur on roots of legumes, those formed by inactive strains of bacteria which do not fix atmospheric nitrogen and those formed by active strains which do fix atmospheric nitrogen. Nodules produced by the former are white, those by the latter are red. The colour is caused by a red pigment known as leghaemoglobin which is similar to haemoglobin of the blood of vertebrates in that it can store and carry oxygen ; it is, however, more easily oxidized than haemoglobin. The iron content in each is the same. Nitrogen fixation occurs in the red nodules during the period of plant growth. When growth ceases, either temporarily by placing plants in the dark or finally at the end of the growing season as in annuals, the pigmentation of these nodules changes from red to green, due to formation of a chromoprotein, and nitrogen fixation ceases.

When the nodules are first formed they are white and receive their nitrogen from the host. In 2 to 4 days' time the red pigment is formed, and the nodules have the power to fix atmospheric nitrogen and transfer it to the host. It is suggested that the assimilable compounds are passed out into the cytoplasm of the host as an excretion since these compounds are also excreted into the culture medium. During this period many new nodules are formed and bacteria multiply rapidly. Later, when vegetative growth ceases, the nodules turn green and nitrogen fixation ceases.

The paper deals also with methods for detecting the ineffectiveness of certain strains of bacteria; technique for determining the haematin, leghaemoglobin, legmethaemoglobin and iron content of the nodules ; purification of leghaemoglobin ; isolation and purification of the green pigment ; the influence of nitrate on nitrogen fixation ; and experiments on nitrogen fixation with free-living legume bacteria : these could not be induced to fix atmospheric nitrogen.—D.B.

BRIGGS, L. H. **Plant products of New Zealand.** *J. Proc. Roy. Soc. N. S. W.* **80.** 151-77. 1947. **637**

Many native plants of New Zealand have been chemically studied but far more remain for future investigation. Analyses are given here for plants in numerous families ; some are recognized as essential oils, others as resins, alkaloids and fibres. Of fourteen endemic Leguminosae, including nine *Carmichaelia* spp., all were found alkaloid-free but several *Acacia* spp. contained high concentrations of alkaloid. *Phormium tenax* yields a high-quality fibre and provides a source of saponins, and some New Zealand seaweeds have been investigated for their iodine, potassium and other mineral content. —M.E.E.

BOOKS AND PERIODICALS

Est Midland Group on Post-war reconstruction and Planning. **English county. A planning survey of Herefordshire**. 29 × 23. pp. 266. pls. London : Faber and Faber, Ltd., 24 Russell Sq., W.C.1. 1946. 21s. **638**

“ Careful study of the geography of Hereford-
ire has revealed that the main contribution
hich the country can make to the national
onomy after the war is an agricultural one.”
us it is desirable that the agricultural industry
ould be maintained in a healthy condition and
at its workers should enjoy a standard of living,
ages, housing, etc., equivalent to those living in
dustrial areas.

This first survey of a county in the field of
eration of the West Midland Group (Stafford-
ire, Warwickshire, Worcestershire, Shropshire
d Herefordshire) therefore represents a very de-
iled analysis of Herefordshire, as far as the land,
e people, their economic life in industry and agri-
ılture, and their social environment and public
rvices are concerned. Herefordshire was chosen
the subject of the first survey since it offers
efinite advantages for experimental research and
r the development of a technique of surveying,
cording and mapping.

The book is fully if not lavishly illustrated
ith photographs, maps and diagrams represent-
g the present position pictorially. There are
ppendices dealing with schemes of land classifica-
on, the grassland survey of the county (Stapledon
nd Davies), and the land-use regions.

Of the total acreage of the county (465,000),
7 per cent is in arable (including 4.5 per cent
rchards), 68 per cent is in permanent grass, and
per cent rough grazing. Cattle and sheep are
kely to continue to be the mainstay of the Here-
rdshire farmer, particularly if the level of grass-
nd management improves.

On the arable land, the chief crops are wheat
17.6 per cent of total arable), oats (15.3), orchards
18.2) and clover and rotation grass for hay (16.4).

All the data collected are discussed in relation
o the future planning of the human occupations
nd standards of living, and the agricultural pro-
uction of the county, on a background of national
olicy and needs.—R. O. Whyte.

Beaven, E. S. **Barley—fifty years of observation and experiment.** With a foreword by *Viscount Bledisloe.* 23 × 15. pp. xx + 394. 50 figs. London : Duckworth, 3 Henrietta St., W.C.2. 1947. £1 10s. 0d. **639**

The author, in his preface to this posthumous
ecord, maintains that the data comprise “ an
ttempt to work out a problem in agriculture ; to
iscover, or to disentangle, the factors of produc-
ivity and of quality in a single species . . . . To-day some 85 per cent of the total acreage of the barley grown in Great Britain is the progeny of four plants, three of which were selected in the nursery at Warminster between the years 1900 and 1904.”

The book is in two parts, designated Observation and Experiment respectively. Under Observation is included information on the following aspects (among others) : the origin and antiquity of barley ; classification and nomenclature of barley varieties ; English barley soils and crop rotation ; harvesting methods ; influence of climate and season on yields and quality of barley in England ; acreages, distribution and yields of barley given separately for England and Wales and for Great Britain ; old, established varieties and new improved races grown in Gt. Britain ; productivity and quality ; and differential response of barley races to environmental conditions.

In the United Kingdom the use of barley in a crop rotation is variable, the necessity for it being largely governed by the need for a spring-grown crop. The suitability of barley for this depends on the district and on the soil. In recent years barley has been grown to an increasing extent after sugar beet and after a clover ley. The author has observed that barley after roots gives a higher yield than after corn, but when it follows a corn crop it stands up better than when it follows roots or sugar beet. Also, while barley after sugar beet gives higher yields than when it follows corn, the quality of the barley is slightly lower.

In the second part, Experiment, an account is given of the author's experimental work in barley breeding and of his conclusions drawn from the data. Among the appendices is a list of the barley species and types still in cultivation at the Warminster nursery. These include (1) Russian barleys (grown continuously from seventy ears received from the British Embassy at St. Petersburg in 1903) ; (2) the Hansen collection (300 ears were received from K. Hansen of Lyngby, Denmark) ; (3) Körnicke collection (grown continuously since 1902 from material sent by F. Körnicke of Bonn University) ; (4) Danish collection (progeny of fifty ears received in 1900 from C. Sonne, Denmark) ; (5) imported commercial varieties (cultures originating from single selected plants from grain of foreign commercial samples collected between 1896 and 1935) ; and (6) established varieties and races (2-rowed barleys of recent introduction).—M. Hall.

Leary, J. C., Fishbein, W. I., and Salter, L. C. **DDT and the insect problem.** 21 × 15. pp. 183. New York and London : McGraw-Hill Book Company, Inc. 1946. 12s. 6d. **640**

The value of DDT as an insecticide in agriculture has already been established. In chapter VII in which the agricultural uses are discussed, both beneficial and ill effects of the insecticide on various plants are noted. Cases are quoted of its successful use against grasshoppers, Colorado beetle, and the cotton pests *Pantomorus leucolama*, *Pectinophora gossypiella*, *Heliothis armigera*, and *Psallus seriatus*, but it is noted that DDT applied to cotton resulted in an increase of aphids and red spiders. The European corn borer (*Pyrausta nubilalis*) and some half dozen tobacco insects are effectively controlled by DDT. Its effect on many miscellaneous field insects and stored-products insects are also discussed. The chapter contains a bibliography of 43 works dealing with the uses of DDT in agriculture.—P. Mackintosh.

STAPLEDON, Sir R. George. **Farming and mechanised agriculture. 1948.** Edited by *Sir R. George Stapledon*. 22 × 15. pp. 403. London and New York : The Todd Publishing Co. Ltd., 1947. 25s. **641**

See also *Herb. Abstr.* 15, Abs. 1669 and 17, Abs. 543.

" This fourth edition of *Farming and Mechanised Agriculture* . . . compares very favourably with earlier editions. All the usual sections a found, carefully revised and brought up to date the latest legislation relating to agriculture is we covered : the Agriculture Bill presented to Parli ment in December 1946 is fully summarized, a recent Town and Country Planning legislation it affects farming is also dealt with. The late developments of the new National Agricultur Advisory Service are described while the Offici Statement by the Ministry of Agriculture a Fisheries outlines the Government's present ag cultural policy seen as a whole. An entirely ne item is the list of agricultural attachés or liais officers at the various foreign embassies in London

Once more a wealth of information on eve phase of agriculture has been brought under o cover. For those interested in agriculture t publication must be regarded as an invaluab reference book.—P. Mackintosh.

RICKETT, H. W. **The royal botanical expedition New Spain 1788-1820 as described in documen in the Archivo General de la Nación [Mexic** Now translated and collated by *Harold Willia Rickett*. *Chron. Bot.* **11.** pp. 86. 1947. **6**

REPORTS

NORTHERN IRELAND. Twentieth Annual Report of the Agricultural Research Institute, Hillsborough, Co. Down, 1946-47. pp. 31. **643**

Experimental work carried out with flax in 1946 included a study of varietal resistance to attack by *Polyspora Lini* and *Phoma* sp. and the prevention of Foot Rot caused by *Phoma* sp. Field work showed that while certain fibre varieties show some resistance to *P. Lini* all of those tested were susceptible to *Phoma* sp. Experiments showed that the proprietary compound Panogen when applied by the short wet method at the rate of 5 or 10 c.c. per 500 gm. of seed gave a substantial control of *Phoma* sp., but did not completely eliminate the disease from the crop.—P.M.

PALESTINE, Department of Agriculture and Fisheries. Annual report for the year 1945-46 (Year-ended, March 31, 1946). Jerusalem, 1947. pp. 48. **644**

The report is divided into four sections : the first section is devoted to a general review of agricultural conditions in the territory (field and forage crops are dealt with on pp. 20-23) ; the second dealing with the work of the Dept. of Agriculture and Fisheries ; the third being a financial statement ; and the fourth dealing with legislation enacted during the year under review.—G.M.H.

NORTHERN RHODESIA, Department of Agricultu Annual report for the year 1946. Lusak 1947. pp. 15. **6**

A review of the production of maize, whea nuts, beans and other crops grown within t country, followed by an account of the work the Dept. of Agriculture for the year 1946.—G.M.

SOUTHERN RHODESIA, Department of Agricultu and Lands. Annual Report of the Branch Botany and Plant Pathology for the year endi Dec. 31st., 1946. pp. 13. [Mimeographed] **6**

Of 454 specimens received, the plant pat ological section recorded 27 diseases for the fi time. A list of the most important is give together with a list of fungi isolated from differe sources. A brief review of diseases in cro including tobacco, maize, and sugar-cane is a given. The botanical section made 1814 determin tions during the year.—G.M.H.

SOUTH AFRICA Department of Agriculture (Agr Ed. Res. Ser. No. 3.) Sci. Bull. No. 246. **Fie experiments at Potchefstroom. A summary investigations conducted during the period 194 1945. (First supplement to Union Departme Agricultural Science Bulletin No. 14 of 194** By *A. R. Saunders*, and *F. X. Laubscher*. 194 pp. 57. **6**

A review of agronomic experiments at Potchefstroom during the period 1940-45, many of which were commenced before 1940 and reported on in an earlier publication (Union Dep. Agric. and Forestry Sci. Bull. 14 of 1942).

In respect of maize the main progress during the period was the development of a new strain of "Teo maize" and of the first South African variety of sweet corn. No yield data are yet available but both types bid fair to give a good account of themselves. Wheat lines from the original *T. timopheevi* cross were available for further hybridization with other varieties. The more important parents as regards rust resistance were the three lines 39W23, 39W62 and 39W73, together with H44-24 and Renown from the U.S.A. and Canada, the line C17 from the cross Steinwedel × *T. timopheevi* obtained from Australia and a few Kenya wheats. In an attempt to transfer the "vulgare" grain characters on to a genetic background of the emmer group of wheats, 87 crosses, either single or compound, were made involving the appropriate species, but so far the desired combination has appeared well-nigh impossible to attain.

Some disappointment has attended the breeding work with sorghums. Selections from earlier crosses between witchweed-resistant strains and the non-suckering Persian type have appeared very promising from the point of view of resistance, plant type and yielding ability, but during the wet season of 1943-44 they all, with a few insignificant exceptions, proved rather susceptible to bacterial leaf blight. A late generation of stalk-borer severely attacked the F_2 crop of crosses between a variety from Potgietersrut (which appeared practically immune to bacterial leaf blight) and the non-suckering selections referred to above. The same fate overtook the F_2 of a series of crosses involving witchweed-resistant strains and the variety Birdproof. The work will therefore have to be repeated.

The first non-shattering strains of soybeans distributed to farmers have become firmly established despite competition from other crops, such as kidney and sugar-beans which have commanded abnormally high prices. The main objects in the second phase of the breeding experiment are early maturity and "long shanks", that is, the raising of the lowest pods to a higher level above ground.

Very little of importance has come out of the numerous crosses between strains and varieties of cowpeas made since 1940. No finality has yet been reached in breeding for eelworm resistance, though progress has been made.

Of the original crosses of peanuts made during 1936-38, the following only have yielded material of agronomic importance:

Hebbal × Rustenburg, *A. nambyquarae* and Jumbo; Java 10 × Rustenburg and *A. nambyquarae*. Virginia Bunch (Valencia type), the standard variety grown in the Union has proved to be a very poor parent in crosses and only the cross Virginia Bunch × Rustenburg has produced a few selections worth carrying forward. These are promising hay types, but of little or no value from the point of view of seed production.

An urgent need has arisen for bean varieties which would meet the complex requirements of the growers of the important bean-growing area of the Transvaal high veld. It was considered desirable to combine the advantageous characters of the large White Kidney which belongs to the species *Phaseolus multiflorus* with those common to *Phaseolus vulgaris* by hybridization. Unfortunately the hybrid is highly sterile and although offspring can be obtained by hand pollination and an entire range of types and combinations secured in advanced generations, it has not been possible to obtain a segregate combining the required agronomic characters with self fertility. Nevertheless some segregates show one or more of the desired characters and have been retained for further breeding work. The object of the experiment is also to breed varieties which are resistant to a wide range of bean diseases so as to minimize the losses of growers from this cause.—G.M.H.

INDIA, UNITED PROVINCES. Annual Administration Report of the Agriculture Department for the year ending 30th June, 1945. Allahabad, 1947. pp. 86. **648**

Agricultural research was organized under four main sections as follows:

CEREALS. Very early rice hybrids, obtained by crossing the exotic Chinese varieties with local improved types showed great promise for unirrigated areas, and fertilizing, ratooning and rotating with *Trifolium alexandrinum* all proved good methods of increasing rice yields. Several varieties of wheat and barley are recommended and a black barley was grown under field conditions for the first time in India at Cawnpore.

OIL SEEDS, PULSES, MILLETS, AND FIBRES. Selection trials were undertaken with linseed (*Linum usitatissimum*) *Brassica juncea*, *B. campestris* and *B. napus*, and certain types are recommended for their high yield and quality. Early and late varieties of *Arachis hypogaea*, *Sesamum orientale* and *Ricinus communis* were secured for different climatic areas of the United Provinces. The earliness, yield, grain size and cob characters were examined in different strains of the millets *Andropogon sorghum* and *Pennisetum typhoideum*, and new varieties of *Zea mays* were multiplied and distributed. Numerous selections of the smaller millets *Panicum frumentaceum*, *Eleusine coracana*, *Setaria italica* and *Paspalum scrobiculatum* were also studied with reference to growth, sheath colour, earliness, ear characters and yield. Work on pulses involved the following species : *Cajanus cajan*, *Glycine max* (=*G. soja*), *Cicer arietinum*, *Pisum sativum*, *Ervum lens* and *Phaseolus* spp. About 600 selections representing an all-India collection of *C. cajan* varieties were studied and some types promise special wilt resistance, hardiness and high yield.

Cotton. Hybridization and survey trials were continued with *desi* cottons which were grown on irrigated and non-irrigated sites throughout the Province. These were compared with American cottons under the same conditions and seed production of improved varieties was established at a farm centre.—M.E.E.

Australia. Report on the progress of agricultural production in Australia, June 1947. pp. 26. **649**

Seasonal conditions for June 1947, are briefly reported for the different States. Details are given regarding wheat, barley, oats, maize, grain, sorghum, rice and fodder crops, and the production prospects are noted in each State. Other crops such as sugar, flax, cotton and linseed are also discussed.—M.E.E.

United States Department of Agriculture. Report of the Chief of the Bureau of Plant Industry, Soils and Agricultural Engineering, Agricultural Research Administration 1946. Beltsville, Maryland, 1946. pp. 64. [Received 1947] **650**

In studies of salt tolerance of plants, six varieties of alfalfa were treated with 1200 to 9600 parts per million total salts. Hegazi and Californian Common showed the greatest tolerance. Further experiments with forage crops showed that Rhodes and Bermuda grass were the most tolerant and did as well in saline cultures as in non-saline soils. All varieties of cotton tested showed less tolerance to sodium sulphate than to sodium chloride or calcium chloride. Acala 1517 and Shafter Acala P-18 showed remarkable salt tolerance. Before irrigation plant growth decreased as the salt increased ; after irrigation plant response was largely conditioned by the degree of soil moisture depletion that took place during an irrigation interval within the part of the root zone having the minimum salt concentration.

High fertility level of the soils of many irrigated areas often cause heavy straw growth and high yields of grain with consequent losses from lodging. To reduce these losses, Overland, a new short-strawed oat was distributed in Idaho and Utah in 1946. It is a mid-season variety, remarkably stiff-strawed, highly productive and resistant to lodging and all known races of oat smut in the area to which it is adapted.

The need for a combine grain sorghum for the more humid parts of the grain-sorghum-producing areas has led to the breeding of short-stalke sorghum varieties with kafir-like grain and heads Earlier types had been susceptible to chinch an bug injury. The new strains now ready for in crease appear to be superior to the commercia Combine kafir in areas where both chinch bugs an charcoal rot are present.

The extensive flax-breeding programme ha achieved great success in the control of flax rust i the North Central States. Since 1942, six new rus resistant varieties have been released—Arrow Crystal, Dakota, Renew, Sheyenne and Victory It is believed that complete control of flax rust wi be achieved when the new varieties have entirel replaced the old ones.

A notable feature of soya bean production i the U.S. is that the varieties grown are most pr ductive in relatively narrow geographic zone Daylight rigidly controls the flowering and fruitin of the beans, and experiments carried out at Belts ville Md. reveal that a two minute increase in da length delayed flowering by 1 day.

In forage crop research, it is noted that co marin, which gives the bitter taste to green forag is also the cause of toxicity in spoiled sweet clove hay or improperly preserved sweet clover silage Studies to determine reasons for coumarin varia tions show that during the first year of growth th coumarin content increases from the seedling stag to mid-summer after which there is a gradual d cline until late autumn, at which time little co marin remains in the top growth and late cut ha was non-toxic.—P.M.

Michigan State College Agricultural Experimen Station. Fifty-ninth Annual Report for th year ended June 30, 1946. East Lansing, 194 pp. 264-94. [Received 1947] **65**

The report includes brief accounts on some o the projects which either have been concluded o which have reached a stage where the direction i which they are pointing is clear.

Items of interest include a variety of barle developed by the Section of Farm Crops, which ha been named " Bay " and which has been intro duced to the trade after extensive field trials. I is believed that the variety will largely replac other varieties for Michigan conditions.—P.M.

Florida University Agricultural Experiment Sta tion. Annual Report for the Fiscal Year endin June 30, 1946. Gainesville, 1946. pp. 20 **65**

Brief summaries of investigations under th various projects are given. The research wo covers 190 projects carried on at the Main Statio 7 branch stations and 5 field laboratories, and i cludes work on agricultural economics, agronom animal husbandry, entomology and plant pat ology.—P.M.

NEWS ITEMS AND SCIENTIFIC NOTES

reat Britain

ollar-saving Sugar Beet **653**

The prospect that they are perhaps unlikely to be peated this year should not be allowed to distract om the excellent results reported by the British igar Corporation for the year ended March 31st last. record harvest of bulk (the tonnage brought to the rporation's factories at 4,552,140 tons was 636,000 ns in excess of that of the previous year and nearly 000,000 tons above the average) yielded 556,731 ns of sugar, or sufficient to cover about one-third of the tal sugar consumption of the country for all purposes the weekly-ration of 8 oz. for a whole year. The sum ceived by the Exchequer assistance fell from £3,972,226 £2,749,780, and accordng to Lt.-Col. Sir Francis umphreys, the chairman, it would have been eliminated tirely had the corporation been permitted to take the uban price at January 1 as the fair price for its sugar. r Francis remarks that an anomalous position has also isen in respect of the values placed upon sugar beet pulp ıd molasses, the by-products of the corporation. The ice of sugar beet is more than double that before the war, ut in line with the Government policy of stabilizing the rices of feeding stuffs only a slight rise has been permitted the price of pulp.The feeding stuff value of pulp is com- arable with oats, which are controlled at £18 a ton. The ontrolled selling price of pulp is £6 12s. 6d. to £7 2s. 6d. a on. Similarly the controlled price of molasses sold to istillers and yeast manufacturers at £6 5s. a ton is far wer than the world price. Evidently the " deficiency ayment" from the Exchequer to the corporation is rather n arbitrary concept. Indeed, Sir Francis claims that the alue to the country of the home-grown sugar industry as never been greater. The sugar produced last season ould alone have required $72,000,000 if it could have been ought at Cuban official prices and the pulp and molasses roduced indirectly saved more dollars in imported feeding uffs. *The Times*, 29 Oct., 1947.—P.M.

ugar Beet Production **654**

The September issue of the *British Sugar Beet Review* ecords that when the Minister of Agriculture announced he targets for increased farm output, he called for a 31 per ent increase in sugar beet production compared with the ears before the war. The Government intend to main- ain the sugar beet acreage in the United Kingdom at not ss than 400,000 acres until 1951 and not less than 75,000 acres thereafter. It is worth noting that last year ,254,000 tons of sugar were consumed valued at 49,500,000. The Minister stated that more factories ould have to be provided to deal efficiently and econ- mically year after year with the produce of the extra cres, and he hinted that a new factory would be erected n the South of England. This is a desirable and overdue evelopment, for many more farmers south of the Thames ould grow beet economically if there were a factory within easonable distance. Until now railway freights have been ubsidized to meet part of their costs of transport to factories in East Anglia or the West Midlands. Chichester and Yeovil were regarded before the war as likely factory centres, and no doubt their claims and those of other places will be considered afresh now. *The Times*, Sept. 22, 1947. —P.M.

Farming Systems **655**

In a letter to *The Times*, Aug. 19, 1947, Mr. J. C. Wynne-Edwards of Denbigh, writes that now, and for years to come every facet of farming will have to give of its best in due proportion. This, he suggests, cannot be achieved unless the whole countryside reverts to the agricultural processes for which each district has been fitted by nature, and the age-old zones of stock-raising, dairying, corn-growing, etc., are re-established. Modern methods should ensure increased production in every sphere. He further states that he has intimate knowledge of a stock-raising district, where owing to war-time regulations, a decline in the total head of stock has been statistically counter-balanced by an increased acreage of inferior cereals, by potato crops of which sizeable proportions failed to reach the markets, and by sales of relatively small quantities of milk. No reflection upon any one is intended by the submission that such an exchange is far from being to the advantage of a long-term agricultural policy.

This reversion would entail a new land survey, since it is not suggested that zones should be confined within hard-and-fast geographical boundaries. The local knowledge of county and district agricultural committees, aided by the N.F.U., and the Central Landowners Association, should enable a comprehensive report to be presented within a reasonable space of time. Ministerial directives could then be reduced to individual instructions to each occupier ordering him to produce an annual minimum of this and that. If these orders were based on accurate assessments of local productivity, there need be no fear of the land itself going back.—P.M.

Expansion of Output **656**

Details of the proposals for the expansion of agricultural output to an extent greatly above anything known before were given in a joint statement by the Agricultural Departments of the United Kingdom. The new levels of production set as the aim by 1951-52 for the principal crops, expressed as percentages of pre-war production and compared with the peak war year and 1946-47 (taking the pre-war level as 100) are as follows :

	1943-44	1946-47	1951-52
Wheat	209	119	160
Barley	215	257	279
Oats	158	150	156
Potatoes	202	209	129
Sugar Beet	137	164	131

The Times, Aug. 22, 1947.—P.M.

France

French Farming 657

In *The Times* of Dec. 4, 1947, French farming is described as a primitive and uneconomic husbandry. This country which before the war was nearly self-supporting in food, is to-day importing large quantities of wheat. The production of French foodstuffs is below the national requirement, which has risen since 1939 because the peasants' standard of living has been raised. The lasting remedy which will restore the " tillage and pasturage" of France to its rightful place is an overhauling of the whole agricultural system of the country. The need is not only to produce more food, but to produce it economically. French farming was before the war an uneconomic affair, in which primitive methods, implying high production costs, made tariffs and a form of food subsidies essential for the sale of its products and their protection from foreign competition. This was partly due to what is at once the strength and the weakness of farming in that country—its variety. While about two-thirds of France is cultivated, only one-third is really fertile—the north (north of a line from La Rochelle to the border with Luxembourg), Alsace-Lorraine and the Rhône and Saône-et-Loire districts. The rest is poor land, more or less intensely worked, and mostly in small family holdings.

There has been a steady exodus from the land to the towns for the last 50 years, a process which quickened in the period before 1939. Casualties and deportations during the war, diminished still further the working force and since 1936 it is estimated that 850,000 people have been " lost " from the land. The other great need is for mechanization. Before the war there were probably not more than 25,000 tractors in the whole of France. It is calculated that 250,000 are needed. Modern farm equipment of every sort is needed including silos and grass-dryers for even before the war France had to import feeding-stuffs for her cattle.—P.M.

Netherlands

Organization of Agriculture 658

The monthly periodical published by the Information Service of the Netherlands Ministry of Agriculture contained in its July number the following articles : the organization of the Ministry of Agriculture, Fisheries and Fodder Supply, by F. Daniëls ; the organization and development of the Agricultural Information Service, by H. T. Tjallema ; the Land and Tenancy Service, by M. J. Boerendonk ; and an account of the work of the Land Reclamation Service (instituted in 1935) and its advisory officers. *Maandbl. LandbVoozlDnst*, July, 1947.—G.M.R.

Flax 659

For the promotion of the flax industry in the Netherlands, two Flax Workers' Schools have been established, situated respectively at Standdaarbuiten in the province of North Brabant and at Koewacht in the province of Zeeland. Each gives a 2-year course covering every aspect of flax growing as well as processing and marketing. The Standdaarbuiten School, which was opened in 1940, awarded 7 diplomas in 1942 and 17 in 1943, in which year it had 36 students. The Koewacht School, opened in 1942, had 45 students in 1943. An account of the origin of these schools has been given by Ir. L. J. A. de Jonge, Director of the Netherlands Flax Institute at Wageningen, and H. K. Korányi in *LandbVoorlDnst* Med. No. 40. 1944. [Received 1947.]—G.M.R.

New Periodical 660

Plant and soil. International journal of plant nutrition, plant chemistry, soil microbiology and soil-borne plant diseases is the title of a periodical which is to be published quarterly under the auspices of the Netherlands Society of Agricultural Scientists. The first issue is to appear shortly. The editors are D. J. Arnon (Berkeley), J. Baeyens (Leuven), F. C. Gerretsen (Groningen), E. G. Mulder (Groningen), and A. C. Schuffelen (Wageningen), and the publisher is M. Nijhoff, The Hague. Subscription : f 17.50 in the Netherlands and f 20.- abroad, with a reduction to members of the Society. *Landbouwk. Tijdschr.* Oct.-Nov. 1947.—G.M.R.

Germany

The German Agricultural Society 661

This Society, founded in 1885 but disbanded under the Nazi regime, was reconstituted in January, 1947, under the Presidency of Dr. O. Schlumberger, President of the Biologische Zentralanstalt für Land- und Forstwirtschaft. For the previous history of the Society, see H. Koch, *Herb. Rev.* 1. 92-3. 1933. A new German Agricultural Society is being organized for the western zone, having its headquarters in Frankfurt-am-Main and dependencies in Hamburg and Göttingen. The Chairman is Karl Lorberg. In the French zone a Scientific Association of Agriculturists and Foresters is being set up under the Presidency of Dr. Lossnitzer and Vice-presidency of Dr. Engels. The seat of the Association is Speyer. *NachrBl. dtsch. PflSchutzdnst*, N.S.1. May, 1947.—G.M.R.

A New Barley 662

The German press announces the production by the Weihenstephan Seed Breeding Station of a new winter barley, the yield of which, on account of its resistance to disease, is up to 25 per cent above the average. During the current year, with a seeding rate of 50 to 60 dz. per ha., the highest yields of any obtained for 40 years have been achieved. *NachrBl. dtsch. PflSchutzdnst*, N.S. 1 April, 1947.—G.M.R.

Denmark

Seed Production, 1947 66

Preliminary results of the computation of seed production areas on 26 July, 1947 compared with the corresponding figures for 1946 :

		1947	1946
Root crops		ha.	ha.
ngolds		1025	1327
dder sugar beet		755	1460
edes		129	1341
rnips		27	304
ld carrots	Red	35	170
	White or yellow	42	174
gar beet	for fodder	123	377
	for industry	166	760
Total		2302	5913
Grassland legumes			
d clover	early	2156	2508
	late and medium-late	6616	6739
hite clover		4347	4252
ike clover		574	541
llow trefoil		762	2521
cerne		47	70
her grassland legumes		260	355
Total		14762	16986
eas with mixtures of legumes and grasses		257	614
Grasses			
cksfoot		5282	7726
rennial ryegrass		5620	5370
alian ryegrass		929	3923
eadow fescue		5862	4939
eld brome grass		179	348
ugh stalked meadow grass		1513	1177
nooth stalked meadow grass		208	206
mothy		1660	1888
d fescue		581	446
her grasses		128	81
Total		21962	26104
ppy		984	1496

ndbrugs. Medd. No. 37. 11 Sept., 1947.—R.P.J.

veden

pointment 664

N. G. Bengtsson, chief assistant at the College of riculture, has been appointed director of Gisselås periment Station in Jämtland. *Jordbruk. FörenBl.* November, 1947.—R.P.J.

edish Hemp Growers 665

The annual meeting of the Association at Wermbol on November was followed by an address by Professor rstensson in which he stated that besides late sowing, ır factors have a decisive influence on crop yield of mp: suitable soil, precipitation conditions, degree of idity of the soil, the presence of potash and phosphoric d. Bog soils are the most suitable for this crop, imarily soils rich in humus. It should never be grown on mineral soils. Hemp gives poor results in years when rainfall is abundant. On soils which are too acid lime should be applied in small doses for several years in succession; attention should also be paid to drainage. The presence in the soil of potash and phosphoric acid has a very favourable effect on the growth of hemp: certain trace elements, such as manganese, copper and boron, are also necessary. *Jordbruk. FörenBl.* 6 Dec., 1947.—R.P.J.

Harvest Prospects 666

In a report from the Central Bureau of Statistics on harvest prospects on 15 October, 1947, it is stated that the estimations of cereal crops are practically unchanged from those of 31 August, 1947. Harvesting was completed by 15 October, in most places under very favourable weather conditions, and quality is therefore good. On the basis of the estimations the Central Bureau has computed the yield of grain at the following amounts (the yield in 1946 and the average of the 10 years 1937/46 are given for comparison):

1000 hkg.	1947	1946	1937/46
Barley	1810	1828	1987
Oats	6805	7827	9644
Mixed grain	4340	5151	5128

Estimates for all root crops are considerably lower than at the same time last year.

Judged as a whole the current year's harvest yield is much below average. *Landbrugs. Med.* 27 Nov., 1947. —R.P.J.

Spring-Sown Oil Plants 667

According to preliminary figures now available the sown contract area in 1947 was 38,000 ha. compared with a harvested contract area of 21,200 ha. in 1946. This is the largest area of spring-sown oil plants ever attained in Sweden. The earlier record was reached in 1944 with a harvested area of 30,300 ha. *Jordbruk. FörenBl.* 5 July, 1947.—R.P.J.

Grain Harvest 668

The latest figures for the poor harvest year 1947 show the bread grain harvest to be 45 per cent less than that of 1946. According to crop reports for 31 August the yield of autumn wheat was 1,693,000 decitons compared with 5,237,000 in 1946; of autumn rye 1,378,000 compared with 2,842,000; of spring rye 45,000 compared with 49,000 and of spring wheat 2,195,000 compared with 1,572,000 decitons. The 1947 wheat area was 10,000 and the rye area 41,000 hectares less than in 1946. The harvest was expected to be for wheat 43 per cent and for rye 51 per cent less than in 1946. *Jordbruk. FörenBl.* 20 Sept., 1947.—R.P.J.

USSR

Scientific Conference 669

This is a preliminary report of the proceedings of the Conference which was called on the initiative of the Institute of Economics of the Academy of Sciences of the USSR in Moscow in December, 1946. It was attended by more than 400 delegates from various scientific bodies and regions of the Soviet Union ; at some later date a full account of the papers read at the conference will be published in a special volume. The more important subjects dealt with were as follows : rational distribution of crops and branches of animal husbandry ; distribution of such crops as cereals, flax, oil plants, sugar beet, cotton, potatoes, fruit and small bush fruit, suburban agriculture, and problems of agricultural economics in general. V. Venzer in *Soc. seljs. Hoz.* 1947. No. 2. pp. 59-64.—H.F.

Plant Breeding 670

The Karabalyk State Plant Breeding Station was founded in 1938 in the province of Kustanaĭ amidst open steppes. The climate is continental. There is little rain, the summers are short and hot, the winds are strong, and the soil in some parts is saline. The article does not enter deeply into any particular activities of the Station ; these are numerous and include the spheres of field husbandry, horticulture and live-stock production. Work is proceeding on the adaptation of maize, sugar beet, soybeans, safflowers, hard wheats, blue × yellow hybrid lucerne, grasses, millets and other crops to the conditions of the surrounding region. The results of all this work are only superficially discussed ; but many plans and intentions are set forth.—*Selek. Semenovod.* 1946. No. 6.—I.Z.

Kenya

Seeds 671

Legislation is to be enacted to provide for the testing and for the control of the sale, import, export and use of seeds. The Bill seeks to improve the standard of the internal seed supplies of the Colony, to protect seed buyers being supplied with seed of unknown origin and quality and to build up a reputable export trade in seeds, which experience has shown can be satisfactorily produced in the Colony.—*Crown Colonist,* November, 1947.—G.M.H.

Tanganyika

Groundnut Scheme 672

Mr. L. A. Plummer, chairman of the East African Ground Nuts Corporation, who is in Nairobi after completing a comprehensive tour, said that the Tanganyika scheme was bound to be a success. Whatever the preliminary difficulties, in the long run men and machines, harnessed to science and proper agricultural practices and given reasonable luck with weather and freedom from pests, must succeed. He would return to London to urge on the Government that if its plans for the development of Tanganyika were to go ahead it must reconsider the allocation of consumer goods for Africans. Unless the African had something on which to spend his surplus cash it would be impossible to get him to work for any appreciable period. Mr. Plummer indicated that certain areas in Kenya might yet be considered for ground nuts.—*The Times,* Oct. 31, 1947.—G.M.H.

South Africa

New Seed-Growing Venture 67

What promises to be one of the greatest seed-growin ventures in South Africa was inaugurated at a meeting i Uppington, when over 500 interested people decided t establish a seed- growing corporation.

Mr. J. J. du Toit, agronomist at the Potchefstroo College of Agriculture, said that many types of seed inclu ing wheat, barley and cotton, could be cultivated on th banks of the Orange River. A ten-mile belt on either si of the river, over a hundred miles in extent, would gi South Africa a seed-growing area rivaling the famo Nile Valley.

The abundant fertile area of the Orange River with i dry hot summer and cold winter lent itself to the pr pagation of every kind of crop. Excellent results ha already been obtained from the best imported seed. Th was only the beginning. It meant that thousands people could farm on the river front, producing all th essential food crops needed for the nation. *Frm's Wkl Bloemfontein,* Nov. 5, 1947.—G.M.H.

Seed Organization 6

A co-operative organization to be known as the Sou African Seed Exchange Co-operative Ltd., has been esta lished. The objects of the exchange are to protect a foster the interests of growers of all varieties of seed i South Africa, and to give all the different seed organiz tions representation on its board of directors. The u timate aim of the exchange is to materially influence exercise a considerable measure of control over the pr duction and marketing of seed in South Africa. *Frm Wkly, Bloemfontein,* Oct. 8, 1947.—G.M.H.

Sunflower Seed 6

It is expected that the strong demand for sunflow seed which has prevailed during the world shortage of oi bearing seeds will decrease as the cultivation of groun nuts increases. Sunflower seed is not popular with oi expressers because the seed has to be decorticated at th factories.—*Fmg S. Afr.* August, 1947.—G.M.H.

Groundnuts 6

The Union has undertaken to supply the Britis Government with 60,000 bags of groundnut seed in th shell for the West African development scheme. Of th quantity 48,000 bags have already been delivered and th balance must be delivered before the end of August.

These deliveries are no loss to South Africa since th British Government has undertaken to replace them wi Nigerian nuts which are not suitable as seed under Ea African conditions.—G.M.H.

Australia

Rice Research 6

Some of the investigational, breeding and pure se production activities with rice have now been resum on the Murrumbidgee Irrigation area. When all t work was suspended in 1942 over 1000 varieties of ri d already been introduced from many parts of the world d the best cultural practices had been determined, cluding land preparation, times and rates of sowing, rtilizers, weed control, watering methods and har-sting. A new Rice Laboratory is planned and a set of ng-term experiments involving the comparison of pical crop rotation systems with rice have been re-signed to include recent agricultural developments the Murrumbidgee Irrigation Area. Problems will tackled at the Departmental Farms and also in co-perative efforts with rice growers.—*Agric. Gaz. N.S.W.*, ne, 1947.—M.E.E.

osta Rica

ppointment **678**

Dr. Manuel Elgueta, hitherto directing genetical work the Experiment Station of the National Society of griculture, Chile, has recently arrived at Turrialba, here he has been appointed head of the Section for Plant ndustry at the Inter-American Institute of Agricultural cience. *Rev. Agric. Costa Rica*, August, 1947.—G.M.R.

ruguay

tudy **679**

Dr. Jorge Spangenberg, Professor in the Faculty of griculture of the University of Montevideo and Head of e Seed Service of the Uruguayan Ministry of Agriculture, at present studying agricultural machinery, sugar beet ultivation and related genetical problems, and grain orghums in the U.S.A. *Agric. Americas*, Oct.-Nov., 1947. —G.M.R.

rgentina

nstitute of Botany **680**

At a meeting held in July 1947, to celebrate the enth year of the Darwinion Institute's existence as part f the National Academy of Exact, Physical and Natural ciences, the following address was presented :—Autoch-honous maizes of the Argentine Republic, by L. R. Parodi, Professor of Botany, Univ. Buenos Aires and Univ. La Plata. *Darwiniana*, Sept., 1947.—G.M.R.

Brazil

Agricultural Production **681**

According to a report of 15 August, 1947, from the Danish Embassy in Rio de Janeiro to the Ministry of Foreign Affairs in Denmark, Brazil's agricultural production is scarcely sufficient to meet the increasing demand for foodstuffs. In 1946 the export of foodstuffs was prohibited and a four-year production programme was drawn up, the most important points of which include an expansion of wheat cultivation and of the indigenous milling industry, control of plant and animal diseases, and the increased use of technical aids in agriculture. Mechanized equipment is available on approximately only 434,000 of the country's 1.9 million farms, and the number of tractors is reported to be but 3380. According to the programme 10,000 tractors are to be manufactured as soon as possible.

In 1946 the rice harvest was approximately 27.7 million hkg. compared with 21.5 million hkg. in 1945. The most important rice growing provinces are São Paulo and Rio Grande do Sul where in 1946 the harvests amounted to 9.5 and 6.4 million hkg. respectively. Sugar production in 1946 was 283 million hkg. compared with 252 million hkg. in 1945 and 251 million hkg. in 1944. Of the quantity produced in 1946, 54 million hkg. came from the province of Minas Gerais and 51 million hkg. from the province of Pernambuco. Production of black beans in 1946 amounted to 10.2 million hkg. compared with 10.0 and 10.4 million hkg. in 1945 and 1944 respectively. Export has been conducted on but a small scale although Brazil is the third largest producing country of this crop in the world. Wheat production has increased from 1.70 million hkg. in 1944 to 2.33 million hkg. in 1945 and 2.48 million hkg. in 1946. Wheat cultivation is practised almost exclusively in the province of Rio Grande do Sul. *Landbrugs. Medd.*, 16 Oct., 1947.—R.P.J.

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ND UTILIZATION AND MANAGEMENT

TLAND, Department of Agriculture. **Scotland's narginal farms. General report.** 1947. pp. 65. **682**

——— **Scotland s narginal farms. Regional report I. The orders.** 1947. pp. 29.

——— **Scotland's narginal farms. Regional report II. The south-vest of Scotland.** 1947. pp. 32.

——— **Scotland's narginal farms. Regional report III. Central cotland.** 1947. pp. 27.

——— **Scotland's narginal farms. Regional report IV. The east f Scotland.** 1947. pp. 27.

——— **Scotland's narginal farms. Regional report V. The north-ast of Scotland.** 1947. pp. 28.

——— **Scotland's narginal farms. Regional report VI. The High-ands.** 1947. pp. 47.

During the war years, much of the marginal d of Scotland was once more brought under the ugh. The economic disadvantages of these ds soon became apparent, but various schemes financial assistance enabled marginal land be kept in production. The certainty of a post-r food shortage meant that intensity of agricul-e on all available land would continue for several rs and adequate data should be available to mulate a post-war policy for these lands. In 4 an economic survey of the whole problem was rted. The General Report deals with the ob-ts and scope of the investigation, the technique ployed and the results in Scotland as a whole. e six regional reports give more detailed in-mation of the results obtained.—P.M.

EST MIDLAND GROUP ON POST-WAR RECONSTRUCTION AND PLANNING. **Land classification n the West Midland region.** 1947. pp. 48. 3. maps in pocket. **683**

" Those who have studied the subject of land e would probably agree that an increased mea-e of control must be exercised if the competing ims of food production, housing and industry the remaining rapidly shrinking rural area of itain are to be adequately and justly reconciled. single section of the community should be in a sition to claim the sole and prior right to any rticular site, to the exclusion of all other claims, until its case has been investigated from the point of view both of the needs of the community and of the interests of individuals." In this way the West Midland Group on Post-War Reconstruction and Planning (Shropshire, Herefordshire, Worcestershire, Warwickshire, Staffordshire) introduces the results of its Land Classification Committee, set up in 1942 to evolve a suitable scheme of agricultural land classification, and to apply it to the area coming within the Group's purview.

The scheme evolved is an objective approach to the problem of land classification, and is based on the physical factors of site (elevation, relief, climate and aspect) and soil (depth, texture and water conditions). Human factors (economic and historical) are not considered. Three major categories of land are recognised : I—good quality land, II—medium quality land, III—poor quality land, and are depicted on a reconnaisance map by dark brown, light brown and light yellow colours respectively.

A brief review of the major elements in the physical geography of the West Midland Region (some 3 million acres) introduces a discussion of the land classification problems and the land classification pattern of the region. Major Category I land occupies 10.7 per cent of the Region's agricultural area, distributed mainly in the three southern counties and virtually confined to lowland areas generally below 400′. The four major areas of this good quality land—the Hereford lowland, the Keele Complex area of east Warwickshire, the Keuper Sandstone belt of north Worcestershire, and the terrace belts of the Severn, Avon and lower Teme, are mapped and described. Similarly the areas of Category II and III and the intermediate areas are considered. A summary and conclusions include recommendations of the Committee.

The book is fully illustrated with photographs, maps and diagrams and provides the necessary basic and logical approach to the problem of land use, not only in the West Midland Region but throughout the country as a whole.—G. M. Howe.

SWITZERLAND, Arbeitsgemeinschaft zur Foerderung des Futterbaues. Mitt. No. 27. Die Herausgabe einer neuen Alpstatistik. [**The publication of new alpine statistics.**] By *E. Ramser*. 19-22. 1946. [Eidg. Techn. Hochschule, Zürich] **684**

Switzerland is foremost among countries which produce agricultural statistics, and also foremost where measurement technique is concerned. Aerial photography is the method to be employed in constructing the new land register.—D.B.

Löhr, L. Die Betriebsformen und ernährungswirtschaftlichen Leistungen der österreichischen Landwirtschaft. [**Types of farming and food production in Austria**.] *Kühn-Arch.* **53.** 27-39. 1940. [Vienna] [Received 1947] **685**

An agricultural survey of Austria immediately after the annexation. It deals with land areas, their classification into land types, land use, and crop cultivation areas ; size and type of farms and yield and value of agricultural products ; and data concerning animal and human populations. Dairy farming was by far the most important and sugar beet and other field crops the least important farm product. Many of the tables give comparable data for Germany in order to bring out the differences in agriculture in these two sections of the then Reich. The article has the distinctive political tendency of its time.—D.B.

ПРЕСНЯКОВА, Г. А. Процессы ирригационной эрозии в горах и предгорьях Тянь-Шаня. *Почвоведение* 1947. *No.* 12. стр. 746-50.

Presnjakova, G. A. [**Processes of irrigation erosion in the mountains and foot-hills of Tjan-Šan**] *Počvovedenie* 1947. No. 12. 746-50. [Dokučaev Soil Inst., Moscow] **686**

This soil study was made in 1944 on a slope of the Fergana range. The following data of erosion under crops are included :

Relief	Irrigation erosion in m^3 per ha.		Crop
	run-off	accumulation	
20°	388.8	66.8	Maize
24°	845	157.5	*Brassica* sp.
11°	73	18.2	Beet
17°	231.3	35.0	,,
5°	30.8	8.8	,,

—M.H.

Canada, Department of Agriculture. Publ. No. 793. Tech. Bull. No. 61. **Farming in the irrigation districts of Alberta.** By *C. C. Spence, B. H. Kristjanson* and *J. L. Anderson.* 1947. pp. 66. **687**

On the whole, the land use pattern in these regions is remarkably uniform, the greater part of the cultivated acreage being devoted to cereal production, mostly wheat. It is suggested that this may be explained by the agricultural youth of the area. The comparative minor varieties in the land use pattern proved to be interesting and four types of farms are considered. They are (1) Grain Farms—where wheat constitutes by far the most important source of farm revenue and flax is generally the season's most important cash crop. (2) Mixed Crop-Livestock Farms—where the proportion of gross receipts was less than 40 per ce from live stock and less than 74 per cent fro crops. (3) Live stock Farms—receiving 40 p cent or more of their gross receipts from the sale live stock. (4) Speciality Crop Farmers—receivi at least 75 per cent of their gross returns from cro of which at least 50 per cent was derived from t sale of speciality crops—generally this was sug beet.

Net returns of farms, by type and area and t financial situation of the main types are then co sidered, and economic studies of ranches and o type farms, labour and farm power problems follo It is concluded that for an expansion of irrigati farming in Alberta, the ideal would be to plan type of farming similar to that practised in ma of the parkland regions of the West, with one two projects able to compete with enterpris elsewhere in the province. Projects which i clude the growing of bulky produce such as sug beet and requiring the establishment of spec marketing facilities, should be avoided.—P.M.

Iowa Agricultural Experiment Station. Io Youth Ser. 1. **Let's save our soil.** By *J.* *Peterson.* 1947. pp. 23. **6**

A popular and illustrated account of soil co servation technique in Iowa. Methods advocat for maintaining rich, deep soils include st cropping and contour farming, crop rotation, u of crop residues, green manures and fertilize Soil and water losses can be reduced by planti grassed waterways, by contouring and terraci on steeper slopes.—M.E.E.

Buck, C. W. **Crop residues serve two farme well.** *Soil Conserv.* **13.** 177-8. 1948. **6**

The value of crop residues for protecting land fro wind and water erosion is illustrated by the expe iences of two farmers of the north-eastern Nebras loess hill region. In this area topography vari from gently to steeply rolling, soils range from s loams to silty clay loam and the average annu rainfall is approximately 30 inches with occasion rains of high intensity. One farmer has cultivat 240 acres under a protective crop residue for years. The rotation consists of corn, oats with r clover, corn ; each year, one field of red clov remains for hay and seed, and red clover is so with all spring small grain. The small grain combined leaving the straw on the field. In t spring subsurface tilling is carried out to a depth 3 inches to cut the clover roots. After disking tear out the clover roots, the second subtilling carried out before planting at a depth of 4 to inches. Planting is done at 3 to 4 inches and t ground harrowed immediately, thus pulling t residue back to the surface and stabilizing conto ridges. After the corn appears, harrowing is on more carried out and the soil cultivated two or th es with a regular tractor cultivator equipped h sweeps. By these methods weeds are con- led and a protective residue maintained oughout the season. Erosion has decreased l the terrace channels are practically silt free. s farmer's yields have been above the county rage and in dry seasons, the advantages of this bble mulch tillage has been outstanding.

The other farmer operates 800 acres of steeply ing land. His rotations are (1) 2 years of corn, s with sweetclover, sweetclover, wheat ; (2) ears corn, oats with red or sweet clover and k to corn. When corn is to follow small grain stubble is subtilled in autumn, at a depth of 3 4 inches. In the spring, the land is subsurface ed again at 4 to 5 inches. The corn is then nted and afterwards the ground is cultivated ce with a rotary hoe and once by a regular ctor cultivator eqiupped with sweeps. When n follows corn a stalk cutter is used first, to cut stalks of the previous crop. The rotary hoe is n used to break the stalks further and cultiva- n proceeds the same way as described for corn lowing small grain. Wheat usually follows ond year clover. In June the clover is mowed l after it dries a one way disk is used to cut up clover and partly cover the residues and start decomposition. The field is then subsurface ed before wheat planting.

In both cases the land is increasing in fertility constant accumulation and maintenance of ganic matter in the soil.—P.M.

JRAYAMA, S. J. Drenos de bambus. [**Drains of bamboo.**] *Rev. Agric., Piracicaba* **22.** 323-5. 1947. **690**

A method of soil drainage by means of hard mboo stems, ten to twelve fastened together in bundle, is described for the Brazilian farmer. ie material is to be had for the cutting, and icient covered drains, lasting 8 to 10 years, able tillage and cultivation to be done without e interruption and danger of erosion entailed by e use of open drainage ditches.—G.M.R.

ARMING SYSTEMS

OORE, H. I. **Background to farming.** 22 × 14. pp. 162. London: George Allen and Unwin Ltd., Ruskin House, 40 Museum St., W.C.1. 1947. 10s. **691**

It was not until the grave crisis of 1939-45 at the great importance of agriculture in the life the nation became manifest. Since then there s developed a keen spirit of enquiry into the asons for the many and varied operations associ- ed with food production. Dr. Moore, in this, s latest book, has provided for this new spirit by riting a guide to the basic qualities of British rming.

By tracing the development of agriculture from the time of the Manor, the open field systems and peasant farmer to the mechanization, the varied rotations and other techniques of our modern farming industry we are provided with not only a useful outline of British farming history but a useful background for the other sections of the book. The development and introduction of the various cereals and root crops, the origin of the plough, the domestication of animals, the arts of reaping, threshing and milling, the development of machinery and other elements are discussed, and their importance in the evolutionary process of world agriculture noted.

The wide diversity of our farming systems is due to the variations in the geographical, geological and economic factors within these islands. The climate of the western counties, from Cumberland to Cornwall, favours grass farming and in this region the concentration of dairy stock is greatest. In the drier east, from Moray Firth to West Sussex arable farming for grains, root crops and grass predominates. In certain farming systems sheep play an important part, in others beef cattle play their part. Each of the major farming systems is described in detail, so are certain of the more specialized systems, pig and poultry, market gardening and fruit and flower culture. Space is also devoted to an account of the present system of farm organization and personnel, the intricacies and mysteries of marketing, the ways in which the various crops are used, whether for human or live stock consumption and the latest developments in husbandry.

This valuable book provides a useful guide to the understanding of the fundamentals of British farming. The broad outline of the history and development of agriculture in this country and the accounts of the various farming systems, presented in an interest-stimulating, non-technical style, provides a valuable background for the student who wishes to develop a more detailed and specialized knowledge and for those who desire a clear and interesting explanation of British farming techniques. Such an absorbing account of the activities of the various parts of the countryside should also prove widely popular with schoolchildren, and farmers and farm workers should enjoy this objective study of their chosen calling.—G. M. Howe.

Moore, H. I. **Farming in Yorkshire.** *J. Inst. Corn Agric. Merchants.* 1. 62-8. 1947. [Dept. Agric., Univ. Leeds] **692**

The author having noted the great diversity of geological outcrop, soil types and the range of rainfall totals (80 in. + in the west 20 in. in the east), lists a seven-fold classification of farming based on physical and economic features. (1) the Wolds, devoted to the four-course rotation and famous for its sheep and malting barley. As a result of the exigencies of war the rotation has been extended to a five-course with two corn crops following the seeds ; (2) Holderness, the wheat and bean land based on the bare fallow ; (3) the North-east Uplands, originally devoted to sheep and the rearing of young stock but with infiltration of dairy farming in recent years ; (4) the Plain of York, agriculturally very complex, potatoes, carrots, beet, peas and flax the principal cash crops, on the very light soils, rye and oats the main cereals ; (5) the Cleveland Lowland, an area of enlightened farmers practising mixed husbandry. The dairy herds are largely self-contained, the wide variety of crops including wheat and fine malting barley ; (6) Central Pennines and North-West Uplands, an area of vast sheep walks. Only stock-raising is practicable though many farmers strive to produce milk ; (7) Southern Pennines, an area where agriculture takes second place to other industries. Proximity to insatiable markets has resulted in dairying and poultry-keeping being the main enterprises.—G.M.H.

IVERSEN, K. Fosforsyre og Kali. [**Phosphoric acid and potash.**] *Svenska Vall-o Mosskfören. Kvartalsskr.* **9.** 161-78. 1947. **693**

In a paper read at the meeting of the Swedish Soil Science Society at Ultuna on 5 November, 1946 it was pointed out that the question of supplying the soil with phosphoric acid was one of Denmark's most serious problems during the war years. In order to maintain the same yield, it is necessary on a farm without live stock to use four to five times as much superphosphate and potash manure as on a farm where the crops are consumed by the animals. The following data show the consumption of artificial manures per ha. and the crop yield in the pre-war years in three Scandinavian countries, Germany, Holland and Belgium.

	Consumption of artificial manures in kg.			Crop yield in hkg. grain.		
	Saltpetre	Superphosphate	Potash manure	Wheat	Barley	Oats
Denmark	77	120	32	30	30	27
Sweden	37	64	47	24	21	19
Norway	61	82	38	20	20	21
Germany	143	133	100	21	22	20
Holland	236	226	114	30	30	26
Belgium	190	170	60	27	26	27

Denmark and Holland are approximately equal with the largest crop yield per ha., but Holland uses four times as much nitrogenous and potash manures and twice as much superphosphate per ha. as Denmark. This is probably connected in part with the larger animal stock and the consequent large amount of stable manure and liquid manure available for the crops in Denmark ; the different storage and use of stable manure also play a part.—R.P.J.

MOLLER, K. Markplanen 1948. [**The field pla in 1948.**] *Ugeskr. Landmn.* **93.** 67-71. 1946 **69**

In the allocation of crops in Denmark the ai must be to maintain the animal stock on as larg a scale as possible. Grass and hay are of the firs importance for cattle. Experience has shown tha Italian ryegrass dies out in severe winters and tha perennial ryegrass may also do so. The mos resistant species are meadow fescue, cocksfoot an timothy.

The advantages of growing peas, lupin an lucerne are emphasized. In periods of crisis an depression there is an increase in the area sow with commercial crops. The sugar beet area must in the main be determined by Denmark total sugar requirement under normal condition as in any case up to the present she has not bee able to compete on the world market. The cu tivation in Denmark of certain new commerci crops such as oil plants, fibre plants, tobacco, etc is restricted by the limited capacity of the factori and by marketing difficulties. Directions a given for manuring of the different crops.—R.P.

KAUTER, A. Die Ertragsleistungen der Acke teilbrache bei ihrer Ausnutzung zur Futterpr duktion. [**Yield of the arable break when use for fodder production.**] *Landw. Jb. Schweiz.* **6** 87-120. 1947. **69**

Arable fodder crops are grown as main cro or as catch crop. Two kinds of arable fodde catch crop are distinguished : for the autum break, seeded in spring or after the harvesting o the main crop with the object of providing a cut i late autumn ; and for the autumn and winte break with the purpose of giving either one cut i spring or a cut in both spring and autumn. Serie of experiments have been conducted for each o these types and tabulated results of yields in gree weight, digestible protein and starch units ar given. From these results it is evident that pu protein content is dependent on stage of develop ment, on season of cutting, and on whether th crop is grown singly or in a mixture with othe crops.

From the information obtained it was possibl to study the effect of competition among crops an composition of mixtures. For mixtures, two fe tures are essential : (1) the crops should be thos which develop simultaneously at correspondin stages of development and (2) one of the specie should not have a competitive influence on th other.—D.B.

SWITZERLAND, Arbeitsgemeinschaft zur Foerderun des Futterbaues. Mitt. Nr. 18. Futterprodu tion auf dem Acker. Kurzgefasste Anleitun für den Anbau von Ackerfutterpflanzen. [**Fodd production on arable land.**] *By A. Kauter. D Grüne* **n.d.** pp. 24. **69**

Switzerland is extending considerably the area for arable fodder crops. For conditions in Switzerland, farmers should concentrate mainly on using vetch as an after crop and clover as a nurse crop for cereals.

An account is given of the different categories of field fodder crops. The first is the preceding crop or winter catch crop, or it may be stubble for spring grazing. Examples are, in order of earliness of ripeness for cutting : winter turnip (a new crop for the alps) ; winter rape ; rye ; rye and winter vetches (*Vicia sativa*, *V. villosa* and the Hungarian *V. pannonica*) ; hairy vetch ; and Landsberger mixture. The second is the catch crop which joins on to a winter crop or summer fallow. Suitable crops are fodder maize, sunflower, marrow-stem kale and Sudan grass. These plants like warmth and give higher yields as catch crops than as after crops for which they are also used. The third category, the after crop, uses the land between cereal harvest and the close of the growing season. These are plants of rapid growth, short vegetative period, and producing abundance of green stuff. Such are summer vetch, summer peas, broad bean, white mustard, summer rape, summer turnip, oats, summer barley, and buckwheat. Alternatively, the crop may be stubble for autumn use.

This system of cropping requires the best methods of cultivation and manuring (described) to ensure good yields. But whatever the method used it should not be such as to affect the main crop adversely. The means of conservation (e.g. ensilage) should be available in case of a surplus. —D.B.

МОСОЛОВ, В. П. Роль многолетних трав в борьбе за высокий урожай. *Совет. Агрон.* 1947. *No.* 2. стр. 7-11.

Mosolov, V. P. [**The role of perennial herbage in attaining high yields.**] *Sovet. Agron.* 1947. No. 2. pp. 7-11. **697**

Perennial herbage has a high transpiration coefficient as indicated by the following figures from Briggs and Shantz ; spring wheat 450 ; millet 293 ; maize 363 ; sugar beet 397 ; clover 797 ; and lucerne 831. Thus perennial herbage utilizes almost twice as much water as do field crops ; and of herbage plants, clover is very exacting with regard to moisture. In dry regions at the end of summer, the available moisture in soil under wheat is completely exhausted. Herbage plants, however, utilize moisture from layers between 0 to 200 cm. and data from the Stalingrad Experimental Station show that moisture in the soil, especially in lower levels, is depleted after a herbage rotation ; the longer its duration the drier the soil becomes. Data are available from experimental stations at Omsk, Umansk, Stavropol and others regarding the relative needs of various herbage species for water and the beneficial influence of the species on soil structure. By improving the physico-chemical composition of the soil, a rotation of herbage plants results in higher yields of subsequent crops.—M.H.

БЛОМКВИСТ, Б. Л. Организация кормовой базы в пригородных колхозах лесной зоны. *Совет. Агрон.* 1947. *No.* 2. стр. 49-53.

Blomkvist, B. L. [**Organization of a fodder basis in suburban kolhozes of the forest zone.**] *Sovet. Agron.* 1947. No. 2. pp. 49-53. **698**

The need for two kinds of rotation, namely, field crop and fodder crop is stressed. When there is concentration on field crops only, animal husbandry suffers from a deficient fodder basis. Data obtained from forty-two kolhozes in the Krasnopoljansk district of the Moscow province are reported. Inclusion of a fodder break in the rotations which consist of about 75 per cent field crops, 17 per cent vegetables with only 8 per cent of the area occupied by herbage, would effect improvement not only in fodder supplies, but in maintenance of fertility.—M.H.

КОНДРАШЕВ, С. К. Севообороты орошаемых земель. *Совет. Агрон.* 1947. *No.* 3. стр. 44-50.

Kondrašev, S. K. [**Crop rotations for irrigated areas.**] *Sovet. Agron.* 1947. No. 3. pp. 44-50. **699**

The history of crop rotation development is reviewed with special reference to cotton and to conditions in Central Asia, Transcaucasia, and south-eastern parts of European USSR.—M.H.

СИДОРОВ, И. С. Вопрос об органических остатках почвы. *Почвоведение* 1947. *No.* 12. стр. 730-5.

Sidorov, I. S. [**The question of organic remains in the soil.**] *Počvovedenie* 1947. No. 12. pp. 730-5. [All-Union Sci. Res. Inst. for Soybean and Castor Oil Plants, Krasnodar Territory] **700**

The work is concerned with questions of the accumulation of organic residues in the soil after a herbage rotation in conditions of deficient moisture (in the south-east region and in the zone of erratic rainfall in the Kuban). A 10-course rotation was started in 1937 and determination of the residues was made in 1946 in the 0 to 20 and 20 to 40 cm. layers. The total residues from the different courses were as follows, in centners per hectare (on an air-dry basis) : 2-year herbage mixture (lucerne and French ryegrass) 115.43 ; 1-year herbage mixture 73.02 ; spring wheat 61.41; winter wheat 37.66 ; *Ricinus* sp. + maize 40.88 ; barley, oats 48.22 ; fallow 32.68 ; winter wheat 32.50 ; soybean, sunflower 38.71 ; and winter wheat 37.68.

The percentage of root and stubble in the general mass of organic residues is given as follows (percentages of total) :

Crop	Root	Stubble	Remainder of organic residues
Barley ..	19	21	60
Lathyrus sp. ..	27	10	63
Sunflower ..	28	8	64
Maize	22	17	60
Winter wheat	30	30	40
Soybean ..	14	24	62
Herbage lucerne ..	38	6	56

The data also include (1) information on N content of plant residues for species given in above table ; (2) percentage decomposition of root residues from a mixture of lucerne and *Agropyron* in the 0 to 40 cm. layer, (70 for a 3-year course, 55 for a 2-year course and 44 for a 1-year course) ; (3) rate of decomposition of organic residues from perennial herbage depending on moisture.

Further evidence is obtained that perennial herbage in a rotation greatly raises the content of organic N in the soil. Under the dry conditions of the area studied, decomposition of residues in the soil is slow, but this decomposition is speeded up by the inclusion primarily of *Agropyron,* or secondarily by a mixture of *Agropyron* and lucerne, or lastly by lucerne alone.—M.H.

PRICE, C. W. **Three crops a season. Corn, soybeans and beef on the same ground.** *Soybean Digest* **8.** 11. 1948. **701**

In spite of the recommendations of the southern experiment stations, a Louisiana farmer managed 100 acres with outstanding success. His fields are cultivated four times before crops are sown and twice when the crops come up. In December, the year's crop residues were ploguhed in. A month later the ground was again broken up and in February it was ploughed again and harrowed : this was followed by an application of 300 lb. of 6-8-4 fertilizer per acre, and the soil was again turned to cover the fertilizer. At the end of March, the fields were planted with corn and soybeans at the rate of 10 lbs. and 2½ bushels respectively per acre. Corn and soybean were planted in the same rows, the soybeans very thick and the corn only 8 inches to 12 inches apart instead of 24 to 36 inches as is customary in the South. The ripe corn was picked by hand to avoid crushing the beans ; the beans were combined. After the beans were harvested, Hereford calves weighing 500 lb. or so were turned on to the stubble. After 90 days on this pasture and a further 90 days on feed, the cattle each weighing nearly 1000 lb. were ready for market.

In 1946 the 100 acres yielded 10,500 bushels of corn, 3500 bushels of soybeans and provided forage for 75 cattle for 90 days. When his corn crop averaged 105 bushels the average for the whole of the South was 20 bushels per acre. This farmer is convinced that his seed-bed, fertilizer application and especially the soybeans, helped the corn.—P.M.

CROPS AND CROP PRODUCTION

VALLE, O. Odling av blandsäd. [**Cultivation of mixed seed (in Finland).**] *Tidskr. Lantm.* **29.** 194-5. 1947. **702**

In Finland mixed seed has been cultivated on a very small scale compared with oats. In 1939 the area was approximately 11,000 ha. (0.4 per cent of the arable area). In Sweden mixed seed is grown on 280,000 ha. or 7.5 per cent and in Denmark on 300,000 ha. or 11 per cent of the total arable area. Mixed seed cultivation is particularly suitable for south Finland.

In a pea-oats mixture peas should form 50 to 70 per cent by weight. A vetch-oats mixture gives good results in south-west Finland where the growing period is longest, but can also be grown in other parts of south Finland with a sufficiently long growing period. To avoid lodging of the crop the vetch content must not be too high : 20 to 30 kg. vetch per ha. should be included in the normal oat seed rate. Mixtures including several species of spring-sown cereals and legumes have been tested at Tammisto and Dickursby. In the basal mixture have been included oats (Golden Rain II), barley (Binder), spring wheat (Diamant), peas (Artturi), and vetch (commercial seed), 20 per cent of each, with a total seed rate of 250 kg. per ha. At Dickursby this mixture in a 3-year trial (1943-45) gave a 10 per cent lower grain yield than oats, but the protein yield was nearly 40 per cent higher.

At Dickursby from 1943-45 an oat-pea mixture in which peas formed 53 per cent of the total amount gave only 4 per cent lower yield than pure oats, while the crude protein yield was 34 per cent higher. In the vetch-oats trial where vetch constituted 34 per cent of the mixture, vetch-oats gave 9 per cent higher grain yield than oats, while the crude protein yield was nearly twice as large or 99 per cent larger than the crude protein yield of oats. These results were obtained during summers which were favourable for the legumes.—R.P.J.

RADEMACHER, B. Übersicht über die resistenten deutschen Zuchtsorten der wichtigsten landwirtschaftlichen Kulturgewächse. [**Resistant German bred varieties of the most important agricultural crops.**] *Nachr. dtsch. PflSchDns* **1.** 81-7. 1947 [Hohenhiem] **703**

The term " resistance " here includes resist-e to disturbances of non-parasitical origin such vinter hardiness and drought resistance, as well o diseases caused by fungi and insect pests. ieties of known resistance to specific ailments given for the following crops: Winter rye, ter and summer wheat, winter and summer ey, oats, maize, potatoes, sugar beet, fodder , peas, beans, vetches, lupins, rape, turnip and .—D.B.

ı, F. Vývojový směr zěmědelství v maďarsku. **The development of agriculture in Hungary.**] *ésrn. čsl. Akad. Zeměd.* **21.** 477-87. [Russian nd English summaries, p. 487.] 1947. **704**

The author has made a survey of Hungary's cultural position, its population, agricultural duction and mechanization. It is hoped that new democratic economic policy will overcome economic difficulties of a relatively overulated agricultural country. Hungary is poor raw materials and has to pay for their imports h the export of agricultural products. Only ough intensification and industrialization of iculture can the standard of living be raised.

The agricultural reform of 1945 is designed to ure better working facilities of the agricultural ulation by dividing the land of large property ers into small holdings. By this means the d of production has been changed and produc- n therefore needs direction. As Hungary's in problem is the import of raw materials, a 3- r plan has been set up, to retain the same rces of agricultural raw material as were avail- e before the land reform. Greater production vegetables and garden produce is being en- raged; export of fattened pigs should be ubled; and it is hoped that maize will replace zings for the rearing of pigs. It is hoped that in- sification of agricultural production will result in ic changes of the population's standard of living, ultimately in increased foreign trade.—K.A.A.

STOVOJ, K. Světové přesuny v pěstování ěkterých technických rostlin. [**The shifting on . world-wide scale in the cultivation of some echnical plants.**] *Věstn. čsl. Akad. Zeměd.* **21.** 75-7. [Russian summary, p. 477.] 1947. **705**

During World War II many technical and cial plants have changed their geographical ce of cultivation. The author mentions a large ortment of plants the Russians had collected n all over the world soon after the revolution. *chyspermum copticum* for the production of mol, *Papaver* sp., and *Eucomia ulmoides* for the duction of guttapercha are amongst those which, n ten years ago, were cultivated to such an ent that the USSR claimed to be independent imports of these raw materials. According to st reports research in this line has since been rted again.

Producers in the U.S.A. have lately shown the tendency to become less dependent on shipping of raw materials from the Far East. Amongst items mentioned is "Abaca" Manila Hemp (*Musa textilis*) in Brazil. Aromatic oils for pharmaceutical products and insecticides were solely produced in the Dutch East Indies before "Pearl Harbour." These special plants are now being cultivated for their products in some suitable parts of the American continent.

This shifting of plant production on a world-wide scale will naturally result in a change of the agricultural flora not only of the Far East, but also in other parts of the world to restore the balance between production and markets.—K.A.A.

FOOD AND AGRICULTURE. **Post-war problems of Bulgarian agriculture.** Food Agric. No. 2. 113-6. 1947. **706**

A brief outline of the characteristics of agricultural property and the primitive lines on which the typical Bulgarian farm is run. Crop yields are low. Under normal climatic conditions the average yield for winter grain (wheat, rye and barley) is between 1200 and 1300 kgm. per ha., and for maize from 1300 to 1500 kgm. per ha. Reasons for low yields are, bad economic organization and poor farming technique (shallow cultivation and light fertilizing). Techniques for the improvement of agriculture are given.—G.M.H.

LONDON, UNRRA European Regional Office, Division of Operational Analysis. Operational Analysis Pap. No. 43. **Agriculture in Italy.** 1947. pp. 20. [mimeographed.] **707**

An introductory statement on Italian agriculture, notes that the production of cereals and of wheat in particular, is the country's major agricultural undertaking. Wheat, with other small grains and pulses, dominates agriculture in the south; in the north, wheat enters a rotation which also comprises maize, rice, potatoes and industrial crops. The unusually complex production picture is indicated in a table showing Italian Farm Production in 1933-37, 1945 and 1946. The effect of World War II on the agricultural pattern is shown in tables giving war damage, (some 242,686 ha. of arable land were destroyed and 444,047 ha. damaged, 36,454 ha. of pastures and meadows destroyed and 48,323 ha. damaged, etc.) and land utilization figures for 1933-37, 1945 and 1946.

The fundamentals of agricultural rehabilitation in the country involve a partial shift from the production of grains for direct food consumption to a grain/livestock economy and the reversion to pasture of much marginal land now used for grain production. The projected shift should affect as much as one-sixth of the arable land. The extent to which UNRRA assistance has implemented this rehabilitation is discussed in terms of fertilizers, draught power, seed, farm machinery, pesticides, live stock and technical assistance.—G.M.H.

LONDON, UNRRA European Regional Office, Division of Operational Analysis. Operational Analysis Pap. No. 39. **Economic rehabilitation in the Ukraine.** 1947. pp. 79. [mimeographed.] **708**

The main events leading up to the application of the Ukraine for UNRRA assistance are dealt with in summary statements in the Introduction, the pre-war and present position of farming in the country are dealt with in Section II, industry and transport in Section III and the nature of UNRRA assistance to the Ukraine in Section IV.

In 1937-38, the Ukraine accounted for one-fifth of the grain (wheat, rye, barley, oats, maize and millet), two-thirds of the sugar beet and one-sixth of the potatoes produced in the Soviet Union. In addition a considerable amount of sunflower seed, and smaller quantities of linseed and mustard seed were produced for processing into oil. Other industrial crops, particularly flax, hemp, a little cotton and the rubber-bearing dandelion " kok-sagyz " (discovered in 1931) were also cultivated. Ukrainian farming systems were similar to those of the rest of the USSR, namely, collective farms (kolhozes) and state farms (sovkhozes). Each system is described in detail. In respect of mechanization, the percentage in the Ukraine was greater than in the entire Soviet Union.

The war had serious effects on Ukrainian agriculture. It has been estimated that 27,110 of the collective and 872 of the state farms were completely ruined, and 422,000 collective farm buildings and 423,000 privately owned farm buildings were wrecked. Fifty six thousand tractors, 24,000 harvester combines, 30,200 trucks and agricultural vehicles and 1,892,000 other agricultural machines were destroyed and stolen. The situation was aggravated by the disastrous drought of 1946. The USSR have now introduced a Five Year Plan 1946-50 for the Ukrainian SSR ; the planned crop areas for 1950 are given in tabular form.

Of UNRRA assistance up to January 1947, the greater part of the tonnage of agricultural supplies consisted of seeds, of which 15,669 gross long tons had been shipped by January 31, 1947. Some 310 tractors had been delivered by that date, 6692 tons of bagging, and 244 tons of dairy equipment. —G.M.H.

LONDON, British Intelligence Objectives Sub-Committee. **The agricultural experiment stations of Japan.** [1946]. pp. 92. **709**

A preliminary report based mainly on data supplied by the Japanese Ministry of Agriculture and Forestry and on observations at about fift Imperial and prefectural agricultural experimen stations and branch stations. In research wit field crops, relatively more attention is given t laboratory research and less to field experiments possibly because land for the latter is limited. Thi means that relatively more dependence is place on deductions from general principles believed t have been established and less on empirical trials also that much more attention is given to establishing principles. Some of the methods, facilities an techniques designed to furnish information to serv as a basis for better practices or for breeding ne varieties of wheat and rice are given, togeth with information on field plot techniques. Not on the improvement of rice and wheat varieties a followed by statements of plant disease control, list of the principal diseases of field crops and th names of the causal organisms generally accept by Japanese authorities.

The most striking feature of the Japane system is the large number and relatively small si of experimental stations. The wide diversity climate means that many stations are necessar to serve all agricultural areas properly; the is also a tendency to set up small station for special problems and single crops. Th Imperial agricultural experiment station at Nishigahara in Tokyo, established in 1890 was the fir of the present agricultural experiment stations now there are a total of 595 Imperial, prefectura and private, main, branch and substations, experimental farms, service stations, and researc laboratories serving Japanese agriculture.—G.M.

MAGEE, C. J. **Population and agriculture of South-east Asia.** *J. Aust. Inst. agric. Sci.* **13.** 28-3 1947. [Dept. of Agric., Sydney, N.S.W.] **71**

The general character of agriculture in thos lands which form south-east Asia is describe Only a very small proportion of the land is held i the form of estates, most of the tilled land bein devoted to food crops grown by small farmer The chief crop is rice and the wet and dry system of its cultivation are described. There is a account of the growth, harvesting and utilizatio of the oil palm (*Elæis guinneensis*). The yield oil from palm fruits is about 31 per cent palm and 7 per cent kernel oil. The annual yield p acre of plantations in full bearing is about 1800 l of palm oil and 450 lb. of kernels. A description the growth of the manila hemp industry is al given. The plant from which the fibre is e tracted, namely *Musa textilis*, is indigenous to th region. Early outbreaks of bunchy top disease manila hemp in the Philippines and more recent occurrences in British North Borneo, led to experiments to identify the disease. It is now recognize as identical with the banana virus disease.—M.E.

OCKDALE, F. **Factors of agricultural production in the British colonial empire.** *Nature* **161.** 337-41. 1948. [Adv. and Devel. Planning, Col. Office] **711**

Climate is the master influence on agricultural tivities and production and determines the major il zones and systems of agriculture. Climatic nditions within the Colonial Empire cover a wide nge from the super-humid of the tropical rain lt with its heavy forest, through the humid with lesser forest or parkland vegetation to the sub-umid with grass covered savannahs and thence to mi-arid steppe or desert with sparse vegetation. roduction in the tropical rain belt with an annual infall in excess of 80 in. includes timber and rest products, oil palms, coconuts, rubber, cacao, nanas, sugar, rice, and certain root crops. The roduction of the drier forest, parkland or grass vannah areas with rainfall ranging from 30 to in. includes cotton, maize, millets, groundnuts, nd live stock, and in areas of low rainfall millets e grown and live stock predominate.

Discussing soils it is noted that the use of ass leys has been shown in Uganda and elsewhere improve crumb structure and this system is now tending there and being tried elsewhere. Grass so is a natural protection against erosion. The ajority of lands of colonial territories in Africa ve sub-humid conditions and while mixed farm-g is likely to be the best system for peasant pro-uction, other systems involving the use of grass ys and fertilizers will have to be worked out for rge scale production.

“ Shifting cultivation ” the basic system of bsistence agriculture employs a rotation of land against rotation of crops. It is the standard ractice of a very large number of peasant culti-ators of Africa, and also of other tropical terri-ries in areas where rice cultivation has not been tablished. At the other end of the scale there e highly organized systems under estate manage-ent where considerable use of the services of ience has been made. Estate cultivations have ade increasing use of fertilizers but the experi-ental work with fertilizers has been mainly con-ned to the requirements of the cash or export ops. Little has been done where food crops are ncerned except in regard to rice, largely because the low unit monetary values of these crops.

Cotton production requires the continued pro-uction of new types suited to the particular con-itions under which they are grown ; sugar culti-ation also depends almost entirely on the growth improved strains of seedling varieties. Other amples are quoted and breeding work on cassava, ce and millets is discussed. The article concludes ith a discussion of pests and diseases with em-hasis on plantation crops, marketing arrange-ents and the introduction of bulk buying and lling of certain colonial commodities and social organization. Productivity of land depends as much upon a sound system of land tenure as upon improved agricultural practices. It would seem that a solution of the social issues involved must lie ‘ in finding a balance between the advantages and disadvantages of the traditions of the past, the customs of the present and the needs of the future. Bold experiments may have to be made.’ —G.M.H.

NEW ZEALAND Department of Agriculture. **Primary production in New Zealand.** 1946. pp. 102. **712**

A comprehensive volume giving among other things, details of land utilization, production, climate and topography, systems of farming and the main agricultural products of New Zealand. Under pre-war conditions the country’s seed requirements of cereals were all locally produced, but most of the *Brassica* seed supplies were imported. Only in peas had there been developed any export trade of crop seeds. The main varieties of wheat grown locally are not known in commerce elsewhere. Cross 7, the most widely grown variety, is one bred for local conditions and released by the Wheat Research Institute. Supplies of seed oats and seed barley are produced locally from stocks originally imported into the country. The scheme of seed certification operated by the Department of Agriculture is intended to cover seed wheat, seed potatoes and *Brassica* seeds. The chief aims in the certification of these crops are varietal purity and freedom from seed-borne diseases, particularly loose smut of wheat and virus diseases of potatoes.—G.M.H.

WASHINGTON, Caribbean Research Council. Crop Inquiry Ser. No. 4. **Root crops and legumes in the Caribbean.** 1947. pp. 141. **713**

Three outstanding facts emerge from this study. The first is the unorganized nature of the production of root crops and legumes. Production is almost exclusively in the hands of small farmers. Occasional references are made to the cultivation of sweet potatoes or yams or blackeye peas on estates in certain territories. In the main, however, products are raised in small quantities on thousands of small holdings, periods of glut alternating with periods of scarcity.

The second fact is the virtual indifference with which the cultivation of root crops and legumes is regarded. Several territories can provide no information concerning the varieties cultivated. Where such information is available, the complaint is encountered, as in Puerto Rico in the case of sweet potatoes, that there is a lack of good varieties suited to the local environment. The use of manure or fertilizer is rare. Inevitably, yields are low. The present study may be regarded as variations on the theme of the Puerto Rico memorandum—low yields are due to the fact that commercial fertilizers are either not used at all or are used in insufficient quantity.

The third fact that emerges is the primitive nature of the limited processing facilities available. The chief products to-day are cassava starch, cassava meal (as a livestock food), cassava bread and cakes, cassava flour, arrowroot starch. With the exception of arrowroot starch in St. Vincent, none of these is of any consequence. It could hardly be otherwise when one reads of the primitive graters used in British Honduras, or the primitive mills existent in Antigua. [See also *Herb. Abstr.* 17, Abs. 22 and 23.]—Extracted from Introduction.

ECONOMICS OF CROP PRODUCTION

LANDWIRTSCHAFTLICHES JAHRBUCH DER SCHWEIZ. Preise landwirtschaftlicher Erzeugnisse und Ernteerträge in der Schweiz 1945. [**Prices of agricultural products, and harvest yields in Switzerland, 1945.**] *Landw. Jb. Schweiz.* **60**. 593-639. 1946.

Preise landwirtschaftlicher Erzeugnisse und Ernteerträge in der Schweiz 1946. [**Prices of agricultural products, and harvest yields in Switzerland, 1946.**] *Landw. Jb. Schweiz.* **61**. 381-423. 1947. **714**

Prices paid to producers for different months of the years 1945 and 1946 respectively and in the different Cantons, are tabulated for cereals, animal fodder, eating and fodder potatoes, vegetables, orchard and forest products, and animal products. Wholesale prices in the large towns (Zürich, Berne and Lausanne) are also given. Further tables give acreage yields, and details for individual crops including fodder, cereals, and industrial crops.—D.B.

SEEDS

WESTON, W. A. R. D. **Modern trends in seed disinfection.** *Fmg* **2.** 80-2. 1948. **715**

Wet treatments, copper sulphate for wheat only and formalin for wheat, barley, oats and rye have been discarded in favour of the process of dry disinfection in the treatment of grain before sowing with fungicidal powders. A short account of the more important seed-borne diseases of wheat, barley, oats and rye is followed by notes on the importance of disinfection and precautions that should be taken during the actual application of the dressings.—G.M.H.

HORNE, F. R. **Better seeds, better crops.** *Food Agric.* No. 4. 278-80. 1948. [Nat. Inst. Agric. Bot., Cambridge] **716**

A brief account of the methods whereby the National Institute of Agricultural Botany, Cambridge is stimulating the production of better seeds.—G.M.H.

ВОРОНА, Г. Б. О качестве семян сельскохозяйственных культур. *Селек. Семеновод.* 1946. *No.* 11-12. стр. 48-50.

VORONA, G. B. [**Seed quality of agricultural crops.**] *Selek. Semenovod.* 1946. No. 11-12. pp. 48-50. **717**

In sowing cereal and legume grain crops, absolute seed weight should be considered as a criterion of seed quality. A study of this factor in regard to the amount of yield has been carried out since 1936 at the Kiev Seed Control Laboratory in collaboration with certain kolhozes in the Ukraine, and during 1942-4 the tests were extended to the Saratov Province. The superiority of seed with high absolute weight has been demonstrated and tabulated data are available from different localities in the Kiev, Poltava, Dnepropetrovsk, Odessa and Saratov provinces. For example, a coarse Golden Rain oat (from Kiev region) with absolute weight of 25 grm. gave a yield of 18.4 centners per ha., a medium oat of 20 grm. gave 16.5 centners per ha., and a fine oat of 17 grm. gave 15.7 centners. Similar fluctuations are recorded for coarse, medium and fine samples of wheat, rye, barley, millet and peas.—M.H.

ГУЖЕВСКИЙ, А. Е. Предпосевное прогревание семян в воде. *Совет. Агрон.* 1947. *No.* 3. стр. 67-70.

GUŽEVSKIĬ, A. E. [**Presowing heating of seeds in water.**] *Sovet. Agron.* 1947. No. 3. pp. 67-70. **718**

Presowing warming of seeds in water (to 44-46°C. for wheat and to 46-48°C. for oats) during 5-6 hours followed by 24 hours' drying in the air, increased the vigour and percentage of germination when tested under farm conditions. An early and simultaneous appearance of seedlings resulted in a better development of plants; consequently the plants gave increased yield of grains which ripened under better conditions.—M.A.O.

ROMANO, J. M. Ventajas de las semillas fiscalizadas. [**The advantages of certified seed.**] *Almanaque Min. Agric. Argent.* **22.** 395-7 1947. **719**

Recognition of the fact that imported seed takes a long time to become adapted to Argentine conditions and that seed for Argentina should be grown in Argentina is little more than twenty years old. During this short time great progress has been made in breeding and growing, and the country now actually exports seed which is in much demand for its good quality. The present article enumerates the advantages of certified Argentine seed for e Argentine grower, and notes means by which e most value may be obtained from small antities of this rather high-priced seed.—G.M.R.

ISEASES AND PESTS

ESTON, W. A. R. D. **Diseases of agricultural crops.** *J. Inst. Corn Agric. Merchants* **1.** 56-9. 1974. [Plant Path. E. Regn. N.A.A.S.] **720**

Parasitic fungi, which reproduce their kind by rming minute spores, are a frequent cause of ant disease. These spores are distributed by rious means, e.g. seed-borne diseases in cereals. isinfection with organo-mercury dresssings is a od disease preventative in cereals, sugar beet, c. For soil-inhabiting fungi like *Ophiobolus aminis* which do not attack crops other than reals and grasses, non-cereal crops are included starve them out. No economic chemical ethods have yet been devised in large scale rming practice for killing harmful organisms the soil. Seed disinfection, clean farming and a und rotation do much to prevent disease but are efinitely not a panacea for all the many ailments which crops are subject.—G.M.H.

OMASZEWSKI, W. Gegenwartsprobleme der Pflanzenquarantäne. [**Present day problems in plant quarantine.**] *Nachr. dtsch. PflSchDnst* **1.** 62-6. 1947. [BiolZentralanstalt für Land-und Forstwirtschaft, Berlin-Dahlem] **721**

Plant quarantine regulations have not been aintained during the war. Until they are re- troduced the danger to crops in Germany and eighbouring countries increases. The conditions quisite to a plant quarantine service are formu- ted. Plant quarantine should be on an inter- ational basis as laid down at the 6th International otanical Congress in Amsterdam, 1935.—D.B.

ALLACE, G. B. **Kromnek disease.** *E. Afr. Agric. J.* **13.** 103-6. 1947. [Plant Pathologist, Tanganyika Territory] **722**

A preliminary report on the Kromnek disease ublished as a result of its discovery in south-west anganyika Territory and the possible serious dverse effects on the agriculture of that country. ost plants of the virus and symptoms on various ost plants are given and whilst there appears little kelihood of eliminating the disease once it has ecome established in a country, control measures hich can be undertaken, are also included.—G.M.H.

MIT, B. **The application of insecticides.** *S. Afr. Sci.* 1. 98-9. 1947. [Principal Entomol- gist, Pretoria] **723**

A brief review of the methods and problems ssociated with the application of insecticides. umigation, sprays, Aerosol bombs, and smoke or g machines are considered.—G.M.H.

PETTY, B. K. **Some properties of new insecticides.** *Fmg S. Afr.* 22. 889-96. 1947. [Insecticide Entomologist, Divn. Entomol. Pretoria] **724**

A review of some of the properties of certain of the new insecticides, based on research work carried out by workers in different parts of the world. DDT, Rothane (DDD), the methoxy analog of DDT, Benzene hexachloride, Chlordane, Toxaphene and some other miscellaneous insecticides are considered with notes on their effects on cereal crops and fodder plants, including lucerne.—G.M.H.

SRINIVASAN, A. R. **Some new hosts for** *Striga*. *Curr. Sci.* 16. 320-1. 1947. [I.C.A.R., School of Mycology, Mycology Section, Agric. Coll. and Res. Inst. Lawley Road P.O., Coimbatore] **725**

The members of the genus *Striga* are parasitic on many graminaceous plants, some of which are important food crops. Of these, *Striga densiflora* and *S. lutea* have been known to attack sorghum (*Sorghum vulgare*) in Madras Province. In Bombay Province they are reported to parasitise on crops of Italian millet (*Seteria italica*) and Bajra (*Pennisetum typhoideum*). *S. euphrasioides* is found in rice. The author records the first authentic case of the parasitism of *Striga densiflora* in the genus *Eleusine*.—G.M.H.

HOLTON, C. S. **Host selectivity as a factor in the establishment of physiologic races of** *Tilletia caries* **and** *T. foetida* **produced by hybridization.** *Phytopathology* **37.** 817-21. 1947. **726**

Evidence is presented which shows that the selective influence of the host is an important factor in the establishment of physiologic races of the wheat bunt fungi produced by hybridization. The highly susceptible variety Hybrid 128 tends to promote the establishment of races with low virulence. Highly resistant varieties tend to promote the establishment of races with high virulence. These results are substantiated by practical experience. The population of highly virulent races is greatest in regions in which many new smut-resistant varieties are grown. This study re-emphasizes the importance of a continuous programme of investigation on the bunt problem, embracing the genetics of bunt resistance, breeding bunt-resistant varieties, the biology of the bunt fungi, and seed treatment method and practices.—From Author's summary.

ROARK, R. C. **Some promising insecticidal plants.** *Econ. Bot.* **1.** 437-45. 1947. **727**

Several of the lesser known plants that seem to have sufficient insecticidal properties to justify further research are discussed. Some of them have a direct bearing on the field control of pests. *Heliopsis longipes* grows near Mexico City. There, an insecticide is prepared from its roots. In tests conducted by the Bureau of Entomology and Plant Quarantine, it was found that an amide yielded by the roots was toxic to the codling moth larvae and several leaf-eating insects. The stems and roots of the Mexican plant *Ryania speciosa* contain alkaloids toxic to many kinds of insects. In 1943 a proprietary insecticide prepared from the plant was tested against the European corn borer, gave excellent control and was equally as effective as DDT. The seed of the lily, *Schoenocaulon officinale* has been used as an insecticide since the sixteenth century. It was not until World War II that its practical application to insects injurious to food crops was investigated. To date it has given quite effective control of squash bugs, chinch bugs, harlequin bugs and *Lygus* bugs.—P.M.

Marchionatto, J. B. El fenómeno de la restitución en la defensa de la planta. [**The phenomenon of restitution in plant defence.**] *Ciencia Invest.* **3.** 501-3. 1947. [Prof. Phytopathology, Fac Agron., Univ. Buenos Aires] **728**

Reference is made to an article by Gäumann which lists six types of defensive reaction to pathogens in plants [see *Review of applied Mycology* Vol. 26, p. 22, 1947]. The present author wishes to add a seventh type, namely, the phenomenon of restitution, as a result of which the plant is able to regenerate the organs lost through disease and produce a new individual. After citing instances of this capacity, he notes that although the new organs do not differ in degree of resistance to the pathogen from those destroyed, they can elude the action of parasites and so contribute to the defence of the plant and the conservation of its life.—G.M.R.

Velloso, J. F. Método prático para extinção de formigueiros. [**Practical method of destroying anthills.**] *Bol. Agric. S. Paulo* **44a.** 307-13. 2 pls. 1943. [Received 1947] **729**

A simple means of applying a formicide by means of a bore to the underground tunnels of *Atta sexdens* is described and illustrated.—G.M.R.

WEEDS

Journal of The Department of Agriculture Éire. **Yield experiments, 1946. Trials with Agroxone for weed control.** *J. Dep. Agric. Éire* **44.** 87-90. 1947. **730**

The spray is not objectionable to handle and in these trials, both 1, 2 and 3 per cent concentrations were used on wheat, oats, and barley without causing significant injury to the crops. The slightly adverse effects produced in a small number of instances should not be a deterrent to use of the spray; the 3 per cent copper sulphate solution was frequently found objectionable and at the same time was appreciably less effective than the 1 per cent Agroxone spray for the destruction of charlock and other *Brassica* weeds, particularly those in an advanced stage of growth.

Agroxone spray is injurious to root crops, beans, peas, clovers, flax, etc., and should not, pending further information, be used to control weeds in crops other than cereals. There is risk of injuring clovers undersown, or soon to be undersown, in a cereal crop to which the spray is applied. —G.M.H.

Hofsten, C. G. von. Väsentliga problem inom ogräskampen. [**Fundamental problems in weed control.**] *Lantm. Svenskt Land* **32.** 29-30; 48-52. 1948. **731**

The herbicide itself and the time of treatment are of great importance but the method of spreading is largely decisive in determining success. A detailed description, illustrated by photographs, is given of the various sprayers available.—R.P.J.

КОТТ, С. А. Прорастание семян сорняков. *Совет. Агрон.* 1947. *No.* 4. стр. 86-8.

Kott, S. A. [**Germination of weed seeds.**] *Sovet. Agron.* 1947. No. 4. pp. 86-8. **732**

Germination of weed seeds depends on weather conditions during their formation. Seeds formed in dry and hot years emerge from the dormant condition in a much shorter time than when development takes place under wet and cold weather conditions. Weed seeds which have ripened in dry and hot years germinate well in the autumn with the presence of moisture in the soil, and in that case germination is lower in the spring after overwintering; in wet and cold years germination of weed seeds in the autumn is very low, in the spring after overwintering in the soil it is markedly higher, but is greatly protracted. In the spring after overwintering in the soil, germination of seeds of annual weed plants is better and of seeds of biennial and perennial weed plants markedly poorer, that is, the reverse of germination of weed seeds in the autumn after their ripening. This peculiarity of seeds of weed plants is adapted to their life cycle.

In an experiment conducted in the winter, after a dry and hot year with a total germination of weed seeds of 52 per cent, autumn-germinated seeds constituted approximately 40 per cent and spring-germinated seeds 12 per cent. In addition a considerable portion of the seeds died during the winter and some seeds were physiologically defective. Cultivation measures for the control of weeds are outlined.—R.P.J.

Pavlychenko, T. K. **Agricultural uses of selective herbicides.** 1947. pp. 13. [mimeographed] [Res. Lab. Plant Ecol., Univ. Saskatchewan] **733**

A report giving summarized data from the rk with annual weeds in crops for the season 47, and final records (taken in 1947) on perennial eds which were treated in 1945 and 1946. The mmaries deal with the following experiments: (1) use of Sinox W for controlling annual eds in grain crops; (2) effect of 2, 4-D upon nual weeds and grain yields; (3) herbicidal ssibilities of 2, 4-D for flax; (4) eradication of *nvolvulus arvensis* by 2, 4-D; (5) eradication perennial sow thistle and Canada thistle with 4-D; (6) eradication of *Iva axilaris* by 2, 4-D; effect of 2,4-D on *Centaurea repens* and *Euphor- sula*; (9) pre-emergence treatments with 2, D (greenhouse conditions); (10) pre-emergence atments with 2, 4-D (field conditions); (11) use 2, 4-D for controlling annual weeds on a summer llowed land; (12) use of 2, 4-D for chemical mmerfallow.—P.M.

ARRA, Florinda E., and LA PORTE, J. Las Crucíferas del género *Diplotaxis* adventicias en la Argentina. [**Adventive species of the genus** *Diplotaxis*, **Cruciferae, in Argentina.**] *Rev. argent. Agron.* **14.** 261-72. 1947. **734**

A study of the systematics and cytology of *iplotaxis tenuifolia* and *D. muralis* is presented, th species being at present rare adulterants of ed of crop plants, but possibly of future sig- ficance as weeds.—G.M.R.

ARRA, Florinda E., and LA PORTE, J. *Centaurea repens.* Una maleza invasora de cultivos. [*Centaurea repens.* **A weed invading cultures.**] *Almanaque Min. Agric. Argent.* **22.** 215-6. 1947. **735**

Although one specimen of *Centaurea repens* und in Patagonia was sent to the Darwinion otanical Institute in 1939, its presence in cultures as not discovered until 1942. The plant is a ngerous weed of cultivated land and is considered y some to be poisonous. Growers of cereals and cerne especially are warned to take preventive tion by sowing no seed, lucerne in particular, less it is known to be free of weed seeds, and to amine for the presence of the weed all imple- ents, grain, forage, etc. brought to the farm. [See so *Herb. Abstr.* 15. Abs. 1545.]—G.M.R.

EREALS

MITS, C. De ontwikkeling van de teelt van korrelmais in ons land. [**The development of grain maize growing in the Netherlands.**] *Tijdschr.ned. Heidemaatsch.* **58.** 279-80. 1947. **736**

The growing of maize (*Zea mays*) is not only ossible but also successful in the Netherlands, rovided suitable varieties are used. It is chiefly importance for the sandy regions, and on the smaller holdings particularly. The area occupied by this crop has increased from 272 ha. in 1936 to 4363 in 1947, the greatest increase being from 1940 onwards. The author suggests the possibility of breeding in the Netherlands valuable hybrid strains similar to those which have been produced in America.—G.M.R.

VIEGAS, G. P. O milho, a planta sagrada dos Incas. [**Maize** (*Zea mays*) **the sacred plant of the Incas.**] *Bol. Agric. S. Paulo* **44a.** 346-61. 1943. [Received 1947] **737**

An historical account of maize growing, followed by advice on cultivation.—G.M.R.

FAJERSSON, F. Ökad vårveteodling på bekostnad av övrig brödsädesodling? [**Increased cultivation of spring wheat at the cost of other bread grain cultivation**?] *Lantm. Svenskt Land* **32.** 111-2. 1948. **738**

After the severe winters 1939-40, 40-41, 41-42 and 46-47, approximately 17, 23, 14 and 22 per cent respectively of the autumn wheat area had to be ploughed up. An increase in spring wheat cultivation will contribute to a reduction of risk. To enable the best use to be made of the new, stiff-strawed varieties, larger supplies of nitrogen should be made available to growers.—R.P.J.

СЛОБОДЧИКОВ, Д. Д. Яровая пшеница. *Совет. Агрон.* 1947. *No.* 2. стр. 12-20.

SLOBODČIKOV, D. D. [**Spring wheat.**] *Sovet. Agron.* 1947. No. 2. pp. 12-20. **739**

There is information on the extent of areas under wheat in various countries (Canada, U.S.A., Argentina, and the Soviet Union). In 1939 sowings of spring wheat in USSR amounted to 26.9 million ha. In the kolhozes of the eastern regions (Siberia, Urals, and north-eastern parts of Kazah SSR) the yearly targets for areas sown to wheat are as follows (in million ha.): 1947-7.9; 1948-9.4; 1949-11.4. In the Kuibyšev, Saratov, Stalingrad and Uljanov areas it is hoped to extend sowings (especially of hard wheats) to 2.4 million ha. in 1947 and 3 million ha. in 1948. In the Ukraine production of spring wheat should be maintained, and the fertile black soils should not be used for less valuable feed crops such as barley. Agrotechnical measures necessary for obtaining satisfactory yields are discussed in the light of results from various experimental stations.—M.H.

СУЛЕЙМЕНОВ, И. С. Пшеница в Казахской ССР. *Совет. Агрон.* 1947. *No.* 2. стр. 21-33.

SULEĬMENOV, I. S. [**Wheat in Kazah SSR.**] *Sovet. Agron.* 1947. No. 2. pp. 21-33. **740**

An old proverb of Kazahstan reads: "Gold and silver are only stones but barley and wheat are daily food." The history of agriculture in the country is closely bound with this conception and with the production of wheat, which crop has been grown in Kazahstan for more than 220 years. At first it grew only in oases and on river banks, but now it is cultivated almost everywhere except in the central and south-west desert areas. The climate of Kazahstan is extremely continental, but in the northern part there is an extensive area suitable for arable purposes which is used only to 26·8 per cent of its capacity. This area constitutes a reserve for further growth of grain crops, especially wheat. The suitability of different wheat varieties for various localities and soils of Kazahstan is noted.—M.H.

КАРАСЕВ, И. Пути развития зернового хозяйства восточных районов СССР. *Соц. Сельс. Хоз.* 1947. *No.* 2. стр. 15-20.

KARASEV, I. [**Development of grain husbandry in the eastern district of USSR.**] *Soc. seljs. Hoz.* 1947. No. 2. pp. 15-20. **741**

In the eastern provinces of the USSR soil and climatic conditions are favourable for the growth of cereal crops ; in addition considerable areas of uncultivated fertile land occur. Areas sown with grain crops in the whole of the USSR had increased in 1937 by 11 per cent compared with 1913, in western Siberia by 75 per cent and in eastern Siberia by 110 per cent.

In 1937 in eastern Siberia the production of wheat had increased sevenfold in comparison with 1913 and in Western Siberia threefold. This increase was due to extension of the sown areas and, mainly, to higher yielding capacity. In Siberia high yields of spring wheat are obtained ; in 1946 when in many districts of the USSR low yields of cereal crops were harvested owing to drought, excellent yields were obtained in the eastern districts.

The yield of spring wheat on clean fallow (on an average of 3 years) was 11.8 centners per ha., compared with 6.6. centners per ha. with spring ploughing. According to data from the State varietal trials the yielding capacity of spring wheat surpassed that of winter rye on bare fallow in the Omsk province by 33 per cent, in the Novosibirsk province by 36 per cent, in Kurgansk by 29 per cent, in Pavlodarsk by 49 per cent. On kolhozes in the Altaĭ territory in 1944 spring wheat sown on clean fallow gave yields of from 20 to 24 centners per ha.

Time of ploughing has a marked effect on yield of spring wheat. The yield from plots ploughed in August was 12 per cent higher than from those ploughed in September, and 45 per cent higher than with spring ploughing. The kolhozes and sovhozes of the eastern districts are required from 1947 to 1949 to secure the extension of sown areas by 8 million ha., comprising grain crops on 6.5 million ha., of which 5.5 million ha. shall be spring wheat. Autumn ploughing of the herbage rotation increases the yield of spring wheat compared with spring and autumn ploughing.

The spring wheat variety Milturum 533 is very valuable for Siberian conditions ; it gives a yield 1.5 to 2 centners higher than that of the standard variety Milturum 321. The variety Albidum 3700 also appears promising for the districts in question ; it is not inferior to Milturum 321 in yielding capacity but is earlier ripening. Early ripening and late ripening varieties should be sown on the kolhozes in this region to facilitate the work.—R.P.J.

БЕЛЕЦКИЙ, С. М. Рядковое прикатывание яровых посевов. *Совет. Агрон.* 1947. *No.* 4. стр. 65-7.

BELECKIĬ, S. M. [**Drill rolling of spring-sown cereals.**] *Sovet. Agron.* 1947. No. 4. pp. 65-7. **742**

Drill rolling (rolling along the track of the coulter compressing only the area where the seeds lie) of spring-sown cereal crops in the conditions prevailing in the south and south-east Ukraine has proved one of the best methods of after-sowing cultivation of the soil. It minimizes the effect of drought and raises yields as shown by the following figures :

Method of after-sowing cultivation	Yield (in centners per ha.)	
	Grain	Straw
Drill rolling	8.39	7.14
Non-rolled plots	7.16	5.20
Harrowing with zigzag harrow	6.98	5.16
Rolling with ribbed roller	6.47	4.85
Rolling with smooth roller	7.11	5.62

—R.P.J.

КАРУЗИН, Б. В. О мерах борьбы со щуплостью зерна на юго-востоке. *Совет. Агрон.* 1947. *No.* 2. стр. 34-8.

KARUZIN, B. V. [**Measures to obviate poor grain quality in the south-east.**] *Sovet. Agron.* 1947. No. 2. pp. 34-8. **743**

It has been estimated that grain losses amounting to 50 or even 75 per cent are due to poor development under climatic conditions of the south-east where dryness of the soil and of the atmosphere prevails. The measures usually recommended deal only with soil dryness but much can be achieved to improve grain quality by the construction of wind breaks. Tests made in the Kuĭbyšev region on this aspect of the problem are reported and show that an improvement in 1000-grain weight of 25 to 50 per cent may be obtained in protected sowings.—M.H.

Switzerland, Arbeitsgemeinschaft zur Foerderung des Futterbaues. Der Grünmais. [**Green maize.**] *Die Grüne* **75.** 702-3. 1947. **744**

Because it grows rapidly and gives high yields per ha. this arable crop is an excellent substitute when compensating for failure of the pasture (during times of drought or pest). It should be planted at the latest, in mid-July, but may also be sown with winter barley, winter rye, early potatoes and rape.

For each 10-day feeding period a maximum area of 2a. are needed for each large beast. Because of the low protein content of green maize it is desirable to feed young grass at the same time. The protein deficiency can also be remedied by sowing a mixture of maize and legumes (summer vetch, peas). Varieties of maize vary considerably in weight of grain. The seeding rate can be determined from the weight per thousand grains. The high yield (400-500 kg. per ha.) releases a higher acreage for pasture aftermath.—D.B.

Leonte, A. Lucrări culturale la porumb. [**Cultivation of maize.**] *Anal. Inst. Cerc. Agron. Român.* **16.** 41-52. [French summary, pp. 51-2] 1944. **745**

Maize is cultivated throughout the Bărăgan plain and in other areas of Rumania where conditions are favourable. Tests conducted during the period 1940-4 on cultural measures are reported, with special reference to the best method of preparation of the soil.—M.H.

Toit, J. J. du. **The production of maize.** *Fmg S. Afr.* **22.** 849-56 and 862. 1947. [Coll. of Agric., Potchefstroom] **746**

A detailed account of the production of maize in the Union of South Africa. Two-thirds of the fluctuating annual total output of between 14 and 29 million bags is produced in the "maize triangle" (a triangle with the towns of Carolina, Mafeking and Ladybrand as vertices). The erratic nature of the annual rainfall is the main factor causing fluctuations in annual production ; for best results 1 to 1½ inches of rain are required every 12 to 14 days from the end of October to the end of March. Maize is not resistant to frost and serious losses are sometimes suffered on account of unexpected early frosts in autumn. Soil and fertilizer requirements, time and methods of planting, weed control, harvesting, diseases and pests and rotations are given. The list of the more popular varieties of both dent and flint types of maize includes brief comments on the suitability of certain varieties for specific purposes. An average yield of 15-20 bags per morgen is regarded as a fair return when the crop is cultivated on an extensive scale ; 30-40 bags have been obtained under fairly favourable conditions on the central high veld.—G.M.H.

Muello, A. C. El cultivo del maiz. [**Maize growing.**] *Almanaque Min. Agric. Argent.* **22.** 333-8. 1947. **747**

This article is chiefly concerned with the field growing of *Zea mays* for human consumption as a green vegetable, or "sweet maize." Certain North American varieties are recommended, to be sown from the end of August until January at 10-day intervals, which ensures a constant supply of green ears. Advice is given on sowing methods and information on the industrialization and the various uses of maize.—G.M.R.

КИЗИМА, П. Н. Влияние предшественника и обработки почвы на качество зерна пшеницы. *Совет. Агрон.* 1947. *No.* 2. стр. 39-41.

Kizima, P. N. [**The effect of a preceding crop and tilling the soil on quality of wheat grain.**] *Sovet. Agron.* 1947. No. 2. pp. 39-41. **748**

There is conflicting information regarding the effect on wheat of predecessor crops. It has been claimed that clover and lucerne after tilled crops (beet or potatoes) are most satisfactory, and measures which conserve sufficient nitrates in the soil have been recommended in order to produce grain with a high protein content.

There is indication that a clean fallow is best for winter wheat in USSR, while clover and peas are also satisfactory predecessor crops especially in the western regions. Vetch-oats and some legumes in the rotation are less valuable. The effects of millet, water-melons and maize as predecessor crops on technical qualities and chemical composition of wheat are noted for conditions in the steppe region of the Ukraine (Akimovsk, Zaporože). Winter wheat after water melon has on an average 2.9 per cent lower flour yields and 0.7 per cent lower protein content of the grain.—M.H.

Champlin, M., and Wall, A. **The effect of crop sequence upon the yields and quality of Marquis wheat.** *Sci. Agric.* **27.** 593-9. 1947. **749**

The most important limiting factor which affected the yields and quality of wheat, was moisture. Manuring and the introduction of alfalfa, sweet clover and grasses into the rotation, also influenced the yields. In rotations where alfalfa remained for six years from the time of seeding, better yields were obtained than when it remained for three years only. Similar results were obtained where sweet clover occurred once in a five-field rotation, with two fields fallow and corn for moisture conservation, than where sweet clover occurred once in three fields and moisture conservation was provided once in three years. Manuring and the introduction of a legume increased the average protein content ; weight per bushel and per thousand kernels was affected by the moisture component, being higher after fallow or corn than after oats in rows.

The results indicate the desirability to take measures to conserve humus and nitrogen in prairie agriculture.—P.M.

РОМОЩЕНКОВ, Д. Роль листьев в развитии и урожайности яровой пшеницы. *Совет. Агрон.* 1947. *No.* 3. стр. 79-83.

ROMOŠČENKOV, D. [**The significance of leaves in development and yield of spring wheat.**] *Sovet. Agron.* 1947. No. 3. pp. 79-83. **750**

The depth of seeding (from 1 to 8 cm.) affected not only the morphological features of the plants, the number and size of ears, spikes and grains, but also the rapidity of development, especially seed ripening. Leaf size, which also depends on the depth of seeding, was in all cases related to the size of grains and the length of ears and thus with seed yield. The experiments with wheat, oats and barley in which the plants were variously deprived of leaves, showed that the size of leaf surface affected the length of ears, the number of spikes and grains in the ear, the size of grains and consequently grain yield; in all cases the size and the quality of grain crop were lowered when the leaf area was reduced.—M.A.O.

CANADA Department of Agriculture. Publ. 799. Fmr's Bull. 146. **Winter wheat varieties and their production in Alberta.** By *W. D. Hay, A. G. O. Whiteside, G. B. Sanford* and *A. E. Palmer*. 1947. pp. 12. **751**

Where winter wheat can be grown successfully it outyields spring wheat; it ripens earlier and if drought should occur in mid-summer it is further advanced and thus less susceptible to serious injury. There is evidence to show that it is useful in checking soil drifting, and it may be useful in the controlling of weeds. The principle varieties are described (Kharkov, Yogo, Turkey Red and Jones Fife) and preparation of the land, seeding methods, rates and dates of seeding are given. A description of the control of the common diseases, root rots, and bunt or covered smut is also given.—P.M.

LASSER, E. Das Sortenproblem im alpinen Pflanzenbau. [**The variety problem in alpine crop cultivation.**] *Kühn-Arch.* **60.** 358-68. 1943-44. [Inst. Acker-und Pflanzenbau, Admont, Styria] [Received 1947] **752**

Crops considered are rye, wheat, oats, barley and maize. Winter rye is the chief bread grain in alpine regions. The desirable characteristics for good yields are winter hardiness, rapid development in spring, early ripening and erect stand. Yield depends on these four factors. Summer rye often replaces winter rye, the best variety for the purpose being the native Tyrolese "Jochberger".

For winter wheat the desirable characteristics are winter hardiness, rust resistance, firmness of stand (where harvesting can be carried out by machine), early spring development and ability to withstand dry periods. Since yields are uncertain from the winter form, summer wheat is also grown. Rust resistance is the important property. Suitable varieties are "Huron" of Canadian origin; "Lichtis früher Weihenstephaner"; "DC 2303"; "Hope H44"; and "Normandie".

The large horse population makes oats an essential crop. Breeding for rust resistance is proving an elusive problem and the solution of the rust problem for the present is the cultivation of early or even very late-ripening varieties. Winter barley is not important. Because of slow spring development it is unsuited to the climate. Nevertheless it is, like summer barley, the most rust-resistant of all the cereals. Summer barley is the most dependable cereal as regards yield. Owing to the high precipitation of Styria it is usually fodder barley though some is used for bread. The "Imperial" barleys are the most popular. Maize is grown for silage and for human food. Imported varieties and also a native variety "Weisser Vorarlberger Mais" are grown for silage.—D.B.

FREISLEBEN, R. Die Gersten der deutschen Hindukush-Expedition 1935. [**The barleys of the German Hindukush Expedition 1935.**] *Kühn-Arch.* **54.** 295-368. 1940. [Received 1947] **753**

One of the chief aims of the expedition was the collection of varieties of known cultivated plants in order that genetical characters, which had been lost in the course of time, could be reintroduced into the German material.

The wild barleys (*Hordeum spontaneum, H. crinitum, H. violaceum, H. murinum, H. maritimum* and *H. caducum*) are described and their locations given. The cultivated barleys found were the many-rowed *H. vulgare* and the two-rowed *H. distichum*. Thirteen types of *H. vulgare* and four of *H. distichum* are described, and their distribution is shown on a map. The discussion of the individual characters includes such features as size; strength and elasticity of the stalk; number of rows (in which the paucity of two-rowed types in middle Asia is noted); thickness of spike; grains per spike; awns; glumes; naked barley; colour of grain; size of grain; protein content; seed dormancy; length of vegetative stage; winter hardiness; disease resistance; and yield.

The origin of cultivated barleys is discussed. —D.B.

HORNE, F. R. **Spring cereal varieties. Recommended lists.** *J. Minist. Agric.* **54.** 450-5. 1948. [Nat. Inst. of Agric. Bot.] **754**

A summary table of recommended spring cereal varieties together with explanatory notes on each variety mentioned.—G.M.H.

LEWICKI, S., and BARBACKI, S. Badania nad metodyka ilości wysiewu zbóz w doświadczeniach odmianowych. [**Studies on methods of quantitative sowing of cereal varieties.**] *Mém. Inst. polon. Écon. rur.* **17.** 181-234. [English summary, pp. 229-34.] 1939. [Received 1948.] **755**

The work was presented for publication in January 1938. An attempt has been made to settle the long-standing controversy in regard to whether it is better, when comparing varieties, to sow the same weight of grain or the same number of grains per unit area. The tests were made with winter and summer wheat, barley and oats during 1932-6 on the podzol soil of the experimental fields of the Puławy Institute.—M.H.

JOURNAL OF THE DEPARTMENT OF AGRICULTURE, VICTORIA. **New cereal varieties.** *J. Dep. Agric. Vict.* **45.** 166. 1947. **756**

Orient oat is the production of a cross between the Palestine and Dawn varieties of *Avena sativa*. This new variety is early-maturing, short-strawed, and particularly good for winter sheep grazing since it makes an excellent grain recovery in the spring. In tests at the Mallee Research Station, Orient has given an average grain yield of 16.2 bushels per acre over the past 11 years.

The new wheat variety released by the Department has been named Diadem. It has combined the high flour quality of White Fife with the prolificacy of the popular Wimmera wheat Ghurka. This new variety of *Triticum vulgare* is mid-season to late and is moderately resistant to flag smut. Average yields over the past 6 years were 29.1 bushels per acre and its use in the Wimmera Plains is specially recommended.—M.E.E.

GEORGIA Agricultural Experiment Station Circ. 154. **1947 Progress Report on corn varieties and hybrid tests.** By *G. A. Lebedeff* and *O. L. Brooks*. 1948. pp. 11. **757**

Results of field performance tests of corn hybrids and varieties are given. The tests were made with commercial hybrids, open-pollinated varieties and experimental hybrids. Results show that adapted corn hybrids are superior to open-pollinated varieties. In North Georgia, the Tennessee hybrids 10 and 15 and Dixie 17 were the leading entries. Wood hybrids S-135 and V45 were high yielding, but have only been tested for one year. Among the open-pollinated varieties, Jellicorse and Neal Paymaster were the best. In Spalding County extremely dry weather in July injured open-pollinated varieties, but the hybrids withstood the dry conditions and gave good yields. The two year average figure of the performances of some of these hybrids and varieties gives better information. Tennessee 10, Jellicorse, Neal Paymaster and Funk hybrid 717 give the best results. The multiple hybrid Ga 7151 (Tennessee 10 × Florida W-1 hybrids) appeared to be well adapted to the Upper Coastal Plain and the Piedmont. In the same section, Louisiana hybrids 518 and 468 × Dixie 18 did well.—P.M.

BOGYO, T. A korszerü kukoricanemesítés. (Az Amerikai heteróziskukorica és nemesítése). [**Modern maize-breeding. (The American hybrid corn and its breeding.).**] Budapest, 1947. pp. 64. [English summary, pp. 63-4] **758**

A short review is given of the Hybrid Maize Conference arranged by F.A.O. in Bergamo, Italy, during July-August, 1947.—M.H.

JOURNAL OF THE DEPARTMENT OF AGRICULTURE, ÉIRE. **Maize growing trials.** *J. Dep. Agric. Éire* **44.** 68-71. 1947. **759**

Trials conducted by the Eirean Department of Agriculture with a French variety of maize, Jaime Gros du Domaine and a Dutch variety Golden Standard, indicate that even in a reasonably favourable season and working with varieties such as these, calculated to be best suited to climatic conditions in Eire, the cultivation of maize for grain production has little hope of success.—G.M.H.

McDONALD, W. J. B. **Summer fodder crops, maize, millet and sorghums.** *J. Dep. Agric. Vict.* **45.** 449-54. 1947. **760**

Under Victorian conditions, and especially in unirrigated districts, pastures must be supplemented by cultivated fodder crops. The kinds of crop suitable for supplying this need are grouped into two main classes—winter growing crops like oats or barley, and summer crops such as maize and millets. Lucerne is only given passing note in that it is a perennial, usually sown on well graded land under irrigable conditions and once well established, remains in continued possession of a field for a period of years. Suitable varieties of maize for fodder are Hickory King and Flat Red, or, if very early crops are desired, some of the flint varieties such as Longfellow or Ninety Day. Japanese millet and Sudan grass are the most popular and useful summer fodders for feeding off purposes, the former being particularly valuable for providing early grazing. Sudan grass is probably the most useful member of the sorghum family, but is capable of developing, under certain growth conditions, a cyanide content dangerous to stock. Nevertheless it is the safest member of the sorghum family to use as a forage crop.—G.M.H.

ХРИСТОФОРОВ, И. Агроботанично проучване на просото в България. *Изв. Камар. Народ. Култ.* Том 1, *No.* 1. стр. 225-38. 1946.

HRISTOFOROV, I. [**Agrobotancial research on millet in Bulgaria.**] *Izv. Kamar. Narod. Kult.* **1.** 225-38. Sofia, 1946. **761**

The work was carried out during 1942 and 1943 with samples of *Panicum miliaceum* obtained from 110 localities throughout the country and sown in fields of the Bulgarian Agricultural Experiment Station at " Obrazcov čiflik." Twenty varieties were found which are classified as follows : Chief varieties of agricultural importance—vars. *flavum, aureum* and *xantheum* ; ordinary varieties (supplementary)—*subflavum, subaureum, album* and *sinereum* ; and the rare supplementary varieties—*griseum, ereum, subsinereum, fatuk, subxantheum, candidum, subalbum, griseolum, subcandidum, subereum, subsanguineum, subfatuk*, and *subgriseum*.—M.H.

BUCHLI, M. Anbauversuche mit Hafersorten. [**Cultivation trials with oat varieties.**] **n.d.** pp. 16. [Eidg. Landw. Versuchsanatalt, Zürich-Oerlikon] **762**

With increasing possibilities for imports the Swiss farmer fears competition from foreign markets with subsequent reduction in the acreage of oats. Government financial support would be forthcoming only if high yields could be guaranteed. The pure lines and crosses grown at present cannot compete with foreign imported varieties particularly those from Svalöf. It is the duty of the Swiss Experiment Stations to examine foreign varieties with a view to selecting those which are best suited to the climate and farming system of Switzerland. A report is given of those varieties and crosses already investigated as regards vegetative development, earliness of maturity, firmness of stand, and yield. Highest grain yields were obtained from " Petkuser Flämingsgold," Petkuser—Flämingstreue and Abed-Minor. Abed-Minor, a Danish variety, has, in addition, thick, stiff stems while the two Petkuser varieties have long, fine stems and lodge in districts with high rainfall. In the future, these three varieties will probably replace Goldregen I (Svalöf). Brune de Mont-Calme is suitable for the Jura and the foothills of western Switzerland. Straw yields were good in Panache de Roye, Brune de Mont Calme, Goldregen I and Petkuser Flämingsgold.—D.B.

KNUDSEN, E. Forsøg med Vaarrug, Byg og Havre 1943-1946. [**Trials with spring rye, barley and oats 1943-1946.**] *Tidsskr. Planteavl* **51.** 331-41. 1947. **763**

The trials were conducted on light sandy humus soil at Jyndevad, Askov (Lundgaard) and Studsgaard, on good sandy humus soil at Tylstrup and on low moor at Tylstrup. Spring rye was compared with barley and oats, firstly, in pure plots and secondly, in mixture.

In comparing grain yield in pure plots, in the sandy soil trials Maja barley has everywhere been highest yielding, Ørn oats slightly lower and Petkus spring rye lowest. The difference between the cereals varied from centre to centre and was greatest at Strudsgaard and Jyndevad and least at Lundgaard and Tylstrup. At Tylstrup barley and oats were about equal. In the trials on low moor, barley and oats changed places with oats as highest yielding, while spring rye here came far below them. Spring rye was thus lowest everywhere, and on the average of the sandy soil trials has given 5.5 and 2.9 hkg. per ha. less than barley and oats respectively, while the corresponding figures for low moor were 11.1 and 14.1 hkg.

The yield of both mixtures lies between the yield of the individual species in pure plots but there the oat mixture (spring rye and oats) is highest both on sandy soil and on low moor. An analysis of the composition of the mixtures shows that in the sandy soil trials spring rye constitutes about one-third of the yield or the same proportion of the mixture as in the seed sown, whereas the rye content in the low moor trials amounts to only one-fifth of the yield. While the content of spring rye in the low moor trials is almost the same in both mixtures, on sandy soil it is slightly higher in the oat mixture than in the barley mixture.

Volume weight of grain was highest for spring rye, closely followed by barley and lowest for oats. Grain weight was highest for barley and nearly identical for oats and spring rye. As regards yield of straw, in the trials on sandy soil, spring rye gave the highest yield, while barley and oats gave considerably less (on the average 17.4 and 13.5 hkg. less, respectively). On low moor oats was the highest yielding, giving on the average 8.5 hkg. more than barley and 7.8 hkg. more than spring rye. The straw yield of the mixtures lies between the yield figures for the respective pure species.

Tendency to lodging was estimated according to a scale of marks from 0 to 10, with 0=completely upright and 10=completely lodged. In the sandy soil trials this tendency was so slight as to be without significance, but it was pronounced in the trials on low moor, the average marks being Maja barley 9.4 ; oats 7.6 ; spring rye 8.3 ; barley mixture 8.1 ; oats mixture 7.9. The barley mixture also was slightly weaker in the straw than the oats mixture.

Plant counts (made on an area of 0.5 sq. m. in all the plots) showed that oats and the oats mixture had the densest and spring rye the thinnest plant stand. The trials have shown that on the sandy soils barley gave a larger yield than oats, but on low moor oats was the highest yielding cereal.—R.P.J.

KOCZOR, F. Az 1942. és 1943. évi hazai termésű rizsek minőségi vizsgálata. [**Research on Hungarian rice in 1942 and 1943.**] *Kisérl. Közl.* **47.** 17-26. [French and Russian summaries, pp. 25-6.] 1947. [Hungarian Expt. Inst. for Agric. Crops, Szeged] **764**

The number of rice samples tested each year is increasing. More than three-quarters are obtained from the regions Bihar, Békés and Szolnok. At present rice is seeded direct, but plantings are made in depleted localities. Production is increasing, and on an average in 1942 was 20.6 q. per cadastral arpent (arpent=2 acres).—M.H.

WAGNER, S. Der Stand der Sortenfrage beim Winterroggen auf Grund der Versuche in den Jahren 1942-1945. [**The variety problem in winter rye as a result of trials in the years 1942-1945.**] **n.d.** pp. 12. [Eidg. Landw. Versuchsanstalt, Zürich-Oerlikon] **765**

The varieties under trial were Mont Calme, Witzwiler, Lenzburger, Adliker, Rothenbrunner and Petkuser-Nachbau. The performance of each variety is given as regards overwintering ability, firmness of stand, earliness of maturity, rust resistance, yield of grain, yield of straw, and quality. Quality includes the milling and baking properties which, however, are not so important in Switzerland because white bread has superseded rye bread.—D.B.

JOURNAL OF THE DEPARTMENT OF AGRICULTURE, ÉIRE. **Field experiments, 1946. Spring wheat variety trials.** *J. Dep. Agric. Éire* **44.** 80-3. 1947. **766**

Trials conducted in 1946 to compare the varieties Progress, imported from Sweden, and Selection No. 1 from a cross between Yeoman and April Red, with Atle. Selection No. 1 proved, generally to be the least satisfactory of the three varieties; it was less resistant to attacks of fungoid diseases, was more susceptible to damage by bad harvest weather, producing as a result inferior quality grain, and the average yield was significantly lower than that of Atle. While Progress was appreciably later in ripening in the 1946 season, results at the majority of the experimental centres showed Progress to be a more suitable variety than Atle.—G.M.H.

WICHMANN, W. Experimentelle Untersuchungen zur Frage der Dürreresistenz bei Sommerweizen und Hafer. [**Experimental investigation of drought resistance in summer wheat and oats.**] *Kühn-Arch.* **56.** 125-62. 1942. [Received 1947] **767**

The several aspects of water relations are recorded for different varieties of oats and wheat in various stages of maturity from young shoot to grain. No method was found by which the breeder could select material for drought resistance. It is noted, however, that the grain/straw relationship is an indication of the reaction of a variety to drought.—D.B.

TIDSKRIFT FÖR LANTMÄN. Rekordtidigt vårvete. [**Record early spring wheat.**] *Tidskr. Lantm.* **30.** 36. 1948. **768**

An exceptionally early spring wheat has been bred at the Plant Breeding Institute, Jokioinen, Finland, and its real value has been verified at Ylistaro Research Institute, from where the variety will be issued to the trade in the immediate future. The wheat, which has been given the name Apu, is 10 days earlier than Tammi wheat and a fortnight earlier than Diamant.—R.P.J.

FAJERSSON, F. Weibulls original kärnvårvete II. [**Weibull's original Kärn wheat II.**] *Agri. Hort. Genet.* **5.** 26-45. [English summary, pp. 43-4; German summary, pp. 44-5.] 1947. **769**

The variety was placed on the market in the spring of 1947. Characteristics of the strain are compared with those of other wheat varieties.—M.H.

AGRICULTURAL ENGINEERING RECORD. **Cleaning combine harvested grain.** *Agric. Engng Rec.* **2.** 51-4. 1947. **770**

The introduction of combine harvesters created a need for cleaning machines of large output, but the large size of machine that was necessary to deal effectively with damp and dirty grain, together with a high quality of workmanship made such machines expensive. Work has now been done by the N.I.A.E. towards developing a cleaning machine that will be both inexpensive and sufficiently efficient for commercial purposes, the Institute's work having been concentrated on separating grain from its impurities by differences in resistance to an air stream or by differences in size.

Three grain cleaners have been made; the first was simply an aspirating leg, consisting of a vertical duct of rectangular section extending upwards from the injector venturi of a pneumatic elevator that was being used to convey grain from an intake pit to a drier. For various reasons work on this cleaner was abandoned. The second, larger machine combined a roller feed, a conventional aspirating leg, an endless woven steel wire band of coarse mesh for removing the large impurities, and a cylindrical screen, only the bottom half of which was perforated for removing small seeds. A third machine was constructed in an attempt to obtain improvements. Grain was fed from a receiving hopper through a balanced feed gate to a cylindrical woven wire screen, driven slowly by two rollers on which it rested. The screen allowed the grain to fall through while straw was carried over, but to ensure that no grain was also carried over, the screen was constantly vibrated by two cams and two rubber toppers. After leaving the screen the grain passed down a wide chute to an aspirating leg. Air for aspiration was constantly circulated and dust was deposited in a settling chamber, where it passed outside through a slit in the base. From the aspirating leg, the grain was conveyed to a short wide elevator the bed of which was made of perforated metal with slots $\frac{3}{32}$ in. wide by $\frac{3}{4}$ in. long and was drawn up this screen by wooden slats of triangular section. The machine was driven by a 2-h.p. electric motor. The small size of the cylindrical screen limits the effective throughput of the machine to 2.5 tons an hour, thus further trials are to be made of the same cleaning machine fitted with a larger screen.—G.M.H.

MENDES, C. T. A mecanização na agricultura. [**The mechanization of agriculture.**] *Rev. Agric., Piracicaba* **22.** 327-39. 1947. [Professor, "Luiz de Queiroz" Agric. Coll., Piracicaba, São Paulo, Brazil] **771**

The subject is discussed with special reference to the Brazilian State of São Paulo and some of its principal crops. (1) *Rice.* The regional climate enables rice to be grown at relatively high altitudes without irrigation: rice-growing under irrigation is less common in the State. Irrigated cultures can be mechanized at every stage (tillage, sowing, cultivation, reaping and threshing), and this is already done excepting in swamp localities where the nature of the land imposes some restrictions. The commoner dryland cultures are generally found in places where mechanized tillage and cultivation entail grave risk of erosion. Mechanized harvesting is practically impossible with existing machinery, for this requires a uniform stage of development in the crop, based on uniform soil moisture, which is unobtainable in dryland cultures. An important requirement for these cultures is the invention of a machine, manual or drawn by animals, capable of threshing rice without injuring it. (2) *Maize.* In some parts of the world the whole process of maize growing can be successfully mechanized. In the State of São Paulo, however, while mechanical tillage and cultivation are desirable in order to increase production, mechanical harvesting, for various reasons already set forth [see *Herb. Abstr.* 18. Abs. 140. 1948], is not successful. (3) *Cotton.* The limiting factor of cotton growing in São Paulo, where the culture is so promising, is the extent to which it can be harvested. All operations up to harvest can and should be mechanized, but cotton-picking machinery is still far from fulfilling the desired purpose. The labour difficulty is not, however, so great as in the United States, for example. The low yield of most regional cotton fields is due primarily to cultural defects such as failure to apply fertilizers and to practise crop rotation. (4) *Mandioca.* Mechanization is not feasible in the case of this crop. Mechanical cultivation would necessitate excessively wide and uneconomic planting.

In general, the soil, climate, and topography of São Paulo dictate a semi-intensive form of agriculture in which the perfecting of cultural technique is more important than reliance on mechanization. There are no fertile plains of the type found in Russia or Argentina, the topography is undulating and sometimes dissected, and the use of machinery frequently entails a danger of erosion.—G.M.R.

PEREIRA, A. Distribução das várias proteínas no grão de trigo. [**Distribution of the various proteins in the grain of wheat.**] *Agron. lusit.* **7.** 245-52. [English summary, pp. 251-2.] 1945. [Received 1948] [Est. Agron. Nac., Sacavém, Portugal] **772**

Flours of four varieties of wheat were obtained at different extraction rates and analysed. For the same variety, the percentage of total protein decreases as the rate of extraction decreases. This is mainly due to the lowering of the glutenin content, for the gliadin, globulin and leucosin show very little variation. In the flours studied, the ratio of gliadin to glutenin was found to be lower than that considered optimal by most investigators. The obvious advantages resulting from a better knowledge of wheats for baking purposes are stressed, together with the necessity of obtaining wheats richer in gliadin to blend with poorer flours.—Author's summary.

ARKANSAS Agricultural Experiment Station. Bull. 466. **Corn seed treatment.** By *E. M. Cralley.* 1947. pp. 10. **773**

In order to combat seedling diseases, the treatment of corn seed has been recommended for some time in various sections of the United States, especially in the Corn Belt. To obtain more complete information regarding the value of corn seed treatment under southern conditions, experiments were conducted from 1943 to 1946. Spergon and Arasan-treated hybrid seed corn produced yields and stands which were 5 to 10 per cent better than untreated seed. When soil conditions at planting time were unfavourable for germination, benefits from seed treatment were outstanding. Marked increases in yields were obtained at one station, with seed treatment at early and medium dates of seeding, but not at late dates of seeding.—P.M.

EKBOTE, R. B., and SAHASRABUDDHE, K. R. **Shrivelled wheat grain from rust-affected crop as seed.** *Nature, Lond.* **161.** 442. 1948. [Wheat Res. Sta., Powarkhera, Hoshangabad, Cent. Prov., India] **774**

Shrivelled grain obtained from wheat affected by *Puccinia graminis tritici* is suitable for sowing if the very thin grains are rejected. From the point of view of yield, however, sowings from such grain result in a loss of about 40 per cent compared with those of a normal seed crop. The loss would probably be less under favourable weather conditions. The use of such seed is recommended in the present circumstances in India where good seed is not available and the possibility of importing it is remote.—M.H.

ТУГАРИНОВ, В. В. Значение правильного хранения зерна. *Совет. Агрон.* 1947. *No.* 2. стр. 42-8.

TUGARINOV, V. V. [**The importance of regulating conditions of storage for grain.**] *Sovet. Agron.* 1947. No. 2. pp. 42-8. **775**

There is discussion of the effects on grain quality of storage conditions with special reference to: weather conditions at harvesting time; season and time of day when harvesting operations are carried out; harvesting methods; respiration of the grain and activity of ferments; phase of ripening when grain is harvested; grain composition; weed content of grain samples; and atmospheric conditions, sunlight and temperatures in relation to incidence of moulds, mites or insect pests.—M.H.

MANN, H. H. and BARNES, T. W. **The competition between barley and certain weeds under controlled conditions. II. Competition with *Holcus mollis*.** *Ann. appl. Biol.* **34.** 252-66. 1947. [Woburn Expt. Sta., Husborne Crawley, Bletchley] **776**

Holcus mollis has overrun much of the light semi-acid arable land near Woburn on Lower Greensand soils; about 2.5 tons of dry rhizomes and roots per acre were dug up on land where it had grown for 10 months. All this rhizome growth occurred within the top 8 in. of the soil. *H. mollis* commonly increases until the roots occupy from 0.11 to 0.14 l. root space per 1 grm. dried roots and rhizomes. It is slightly superior to barley in ability to utilize available nitrogen.

When barley and this *Holcus* are grown together with abundance of food and water for both plants, the effect of the weed on the yield of barley depends on whether the barley or the weed first becomes established and on the rate of sowing the barley. If barley growth begins before that of *Holcus*, it may smother the weed completely and sustain no loss of yield provided the barley is planted thickly enough. If the two competing plants start at the same time, thickness of planting is still able to limit the extent to which the weed can reduce the yield of barley, though even with the thickest planting the *Holcus* can reduce barley yield by one-third. Where *Holcus* is already established in the ground from the previous year and the crop is thinly planted, the weed is able to eliminate the barley completely, but where barley is sown thickly it is still able to give a 50 per cent yield.

With a sparse crop of barley, an increase in the number of weed units makes no difference to the growth of the barley provided the crop becomes well established. Where the crop and the weed start together and so compete on equal terms, any increase of *Holcus* growth is obtained at the cost of an almost equal falling off in the yield of barley, showing that the respective plant growths are almost complementary. Once the weed has fully occupied the soil, it is able to suppress the growth of the barley almost entirely. The barley and the *Holcus* reduce the growth of each other even when the root space and supply of plant food are ample for both.—From Authors' summary.

TILT, J. **Weed control of cereal crops by means of selective sprays.** *Tasm. J. Agric.* **18.** 169-71. 1947. **777**

The effect of various weed control preparations on wild radish (*Raphanus raphanistrum*) in *Triticum vulgare* is described. Dinoc of 1.5 per cent strength at 120 gallons per acre plus 4 lb. per acre of sulphate of ammonia gave a 50 per cent kill, did not damage the crop and gave a yield 83 per cent higher than the control. Dinoc alone, applied at the same rate, was definitely inferior and the increase in yield over the control was only 38 per cent.

Methoxone of 0.1 per cent (active principle) sprayed at 120 gallons per acre gave an almost complete kill and increased the wheat yield by 100 per cent with no adverse effect to the crop. Methoxone dust applied at 200 lb. per acre was not so successful as the spray, the main disadvantage being its slowness of action, and the yield increase due to its use was small. Tables are given showing relative yields and costs of treatment.—M.E.E.

TAPIA, Esmenia A. Dos pulgones perjudiciales a los cultivos de cereales. [**Two insect pests of cereal cultures.**] *Almanaque Min. Agric. Argent.* **22.** 235-7. 1947. **778**

The insects in question are *Schizaphis graminum* Rondani (=*Toxoptera graminum* Rond.) and *Rhopalosiphum maidis* Fitch, which attack young cultures of all kinds of cereals. Information is given on the method of attack, on the natural enemies of these pests, and on means of control, biological, mechanical, and chemical.—G.M.R.

OLGYAY, M. A vetés idejének befolyása a *Puccinia dispersa* Erikss. és *P. triticina* Erikss. rozsdagombák öszi megjelenésére és az uredoáttelelésre. [**The influence of sowing time on the autumnal appearance of** *Puccinia dispersa* **and** *P. triticina* **and on hibernation of the uredo.**] *Agrár. Szem.* **1.** 481-93. [English summary, pp. 492-3] 1947. **779**

Surveys in Hungary show that there are often serious infestations of rust on winter cereals. From a test of three sowing times, the earlier sowings always had greater percentage infection than had experimental plots of later sowings. The microclimate may facilitate infestation, but extension of the disease depends chiefly on the dimension of the centres of infection preceding winter frost and snow.—M.H.

PEPPER, B. B., and WILSON, C. A. **Dichlorodiphenyl-dichloroethane compared with other materials for corn earworm control.** *J. econ. Ent.* **40.** 731-2. 1947. **780**

Experiments were conducted in 1946 for the control of the corn earworm on sweetcorn in New Jersey by the use of DDD and other materials when applied by knapsack duster, power duster and airplane. Good control of the corn earworm was secured, with DDD rating superior to all other treatments in all tests. The control of the corn earworm by airplane application of DDD was not as effective as the hand or power duster application of this material due to several factors such as distribution of dust, direction of flight, and width of swath.—Authors' summary.

NOLTE, H. W. Weissährigkeit an Rispenhirse. [**White spike diseases in** *Panicum.*] *Nachr. dtsch. PflSchDnst* **1.** 111-3. 1947. [Zweigstelle Aschersleben der Biologischen Zentralanstalt, Aussenstelle Bürs bei Arneburg] **781**

The larva of *Elachiptera cornuta* was the cause of white spike disease in *Panicum miliaceum* of Ukrainian origin. Damage by larvae was followed by fungal attack of *Fusarium* spp. Neighbouring stands of *Sorghum halepense* var. *sudanensis*, *S. vulgare* var. *technicum* and *Eragrostis abessinica* were not attacked.—D.B.

LITZENBERGER, S. C., and MURPHY, H. C. **Methods for determining resistance of oats to** *Helminthosporium victoriae*. *Phytopathology* **37.** 790-800. 1947. [Agric. Expt. Sta., Ames, Iowa] **782**

Since 1945 *Helminthosporium* blight of *Avena sativa* has become a major disease in several mid-West States. Methods for inoculating oats to determine their susceptibility to the blight were available under greenhouse conditions, but the present study was initiated to provide methods suitable for large scale use in the field. Susceptible varieties were completely infected by applying mycelial suspensions of the organism to the seed at sowing, on the soil surface after emergence, or to the seedlings by spraying, while resistant varieties, such as Clinton, were unaffected by these methods. For large scale use, resistance or susceptibility of oats to this fungus could be tested by using ground infected straw sown with the seed. Percentage survival proved the best criterion for rating relative blight resistance of the tested oat varieties.—M.E.E.

WATTS PADWICK, G. **Plant protection and the food crops of India. I. Plant pests and diseases of rice, wheat, sorghum, and grain.** *Emp. J. exp. Agric.* **16.** 55-64. 1948. **783**

A discussion into the losses caused by some of the major pests and diseases of several of the more important Indian food crops and an indication of the present state of knowledge regarding their control and the further research that is necessary.—G.M.H.

STOREY, I. F. **Observations on take-all and eyespot diseases of wheat in Yorkshire.** *Ann. appl. Biol.* **34.** 546-50. 1947. **784**

The effect of rotation has been examined; both diseases were found to be encouraged by too frequent cropping with wheat or barley. The incidence of disease in wheat crops following a 1-year seeds ley was influenced by the nurse crop used to undersow the seeds, and also by the time at which the ley was ploughed up. Oats were preferable to either wheat or barley as a nurse crop, and in 1946 late ploughing considerably reduced the amount of eyespot disease present in the following wheat crop.

A 1-year ley is considered to be of too short a duration to ensure the disappearance from the soil of *Ophiobolus graminis* and *Cercosporella herpotrichoides* surviving from the previous crop, and a period of 2-3 years is suggested as being desirable.—From Author's summary.

EL-HELALY, A. F. **The prevention of black stem rust of wheat.** *Phytopathology* **38.** 161-84. 1948. (Farouk I Univ., Alex., Egypt.) **785**

The disease increased with an increase in number of waterings given to the plants and also the increase of nitrogenous manure applied to the soil. The most satisfactory method for reducing the amount of stem rust on wheat was spraying with sulphur of lime; 5 per cent, 2.5 per cent, and 1.25 per cent diluted lime-sulphur all gave substantial increases in yields and high net profits. Completely satisfactory results were obtained by applying the initial spray to the plants when rust was first detected and then by thoroughly protecting the plants until they were almost ripe.—P.M.

LOUBRIEL, M. G. Continuación de los ensayos relacionados con el tizón o caries del trigo (Tilletia). [**Continuation of experiments in relation to covered smut of wheat.**] *Bol. Inst. Invest. Agron.* No. 16. pp. 245-63. 1947. **786**

Experiments have been continued to determine the resistance to *Tilletia* of different wheat varieties by means of artificial infection.

The *T. durum* " Alaga " (Spanish), " Senatore Capelli " (of Italian origin but widely cultivated in Spain), " Garigliano " (Italian), and " Wase Nybai" (Japanese) have shown themselves to be immune. The *T. vulgare* of winter cycle, "Bankut," "Nebred" and " Jassy " (Hungarian, North American and Rumanian respectively) appear to be almost immune. The *T. turgidum* indigenous " Redondillo de Fuentesaúco " and the *T. vulgare*, also of large cycle, " Nuria" (Italian), " Ioturk " and " Rex " (North American), " Barrukan " (Argentinion), and " Camus " (Canadian) show a high degree of resistance.

Amongst the varieties of *T. vulgare* imported and widely cultivated in Spain, the Canadian " Marquis" shows a high resistance, and the Italian " Apulia precoce " shows not a great predisposition. On the contrary the indigenous soft wheats usually cultivated show generally a much greater sensibility.

In order to prove once more the efficacy of the preventive treatment on seeds, other tests have been carried out. The results show that the product " Graminon " is the most effective followed closely by " Abavit Neu."

Copper oxychloride at 17 per cent metallic copper, which gave very good results in previous experiments, has showed itself in these tests to be much less effective. It seems to be confirmed that copper carbonate does not act on the local types of *Tilletia* with the same good results shown in other Spanish regions.—E.B.

LIER, O., and JØRSTAD, I. Forsøk med varmtvannsbehandling mot naken sot på bygg og hvete. [**Experiments on hot water treatment against loose smut of wheat** (*Ustilago tritici*) **and of barley** (*U. nuda*).] *Tidsskr. norske Landbr.* **9-10.** 255-76. [English summary, p. 266.] 1947. **787**

Five years' trials have given the following results : The treatment formerly used against loose smut was to soak the seed grain 3 hours in cold water, thereafter letting the bags stand 7 hours for dripping before soaking them for 5 to 10 minutes in hot water holding 51-52°C. This treatment was varied in different ways, but did not prove efficient for controlling loose smut of spring wheat and barley. It was found that a convenient and efficient method for controlling loose smut of spring wheat was to soak the bags for 2 hours in water holding 47°C, while for barley to soak for 1.5 hours in water of 47°C. Soaking in hot ceresan solution (0.1 per cent) largely resulted in more serious germination injury than soaking in hot water holding the same temperature. After the treatment the seed grain must be cooled in cold water and dried by controlled heat in a grain drier. As in some lots of wheat seed as well as of barley seed the germination is likely to get more or less injured by the hot water treatment, it is recommended to make a pretreatment of small samples from the seed lots to find out how germination comes out. Such pretreatment must be undertaken sufficiently early for allowing examination of the germination before the main treatment. The treatment may conveniently take place in a container possessing faculties for introducing cold and hot water, and if the container is comparatively large, it will be easier to keep constant temperature.—Authors' summary.

EL-HELALY, A. F. **The black point disease of wheat.** *Phytopathology* **37.** 773-80. 1947. **788**

Experiments were carried out between 1940 and 1943 at the Plant Pathology Section of the Ministry of Agriculture, Dokki, Egypt, and of the Faculty of Agriculture of Farouk I University Damanhour. It was established that the disease was due to a species of *Alternaria* and that its spread and distribution depended on the presence of the spores of the casual organism in the air, atmospheric humidity and rainfall, and humidity and size of grain. Germination of the wheat was not affected by the disease, but the grade was lowered. The size of grain was directly related to the incidence of the disease ; the large kernels force open the covering glumes thus affording access to the spores, the glumes of small kernels remain closed, thus avoiding infection.—P.M.

AUSTRALIA, Council for Scientific and Industrial Research. Bull. No. 207. **The fumigation of wheat in bag stacks.** By *F. Wilson* and *F. J. Gray*. 1946. pp. 24. pls. 4. **789**

Calandra oryzae (small strain) was the main insect pest in bagged wheat stowed in S. Australia and Victoria during the war. Carbon bisulphide at 1 gallon per 1000 cubic feet was almost exclusively employed as a fumigant. The use of ethylene dichloride-trichlorethylene at 5 gallons per 1000 cubic feet proved less efficient. Methylbromide has not yet been employed commercially but would have several advantages over the other fumigants. —G.M.H.

AUSTRALIA, Council for Scientific and Industrial Research. Bull. No. 209. **Interaction of insect infestation, temperature, and moisture content in bulk-depot wheat.** By *F. Wilson*. 1946. pp. 31. **790**

A ten months' study into the changes in insect densities, temperatures, and wheat moisture contents occurring in bulk depot wheat inoculated with *Rhizopertha dominica*. Data are given which show that serious damage occurs only near the wheat surface.—G.M.H.

KOBLET, R. Über die Reservestoffbildung in landwirtschaftlichen Kulturpflanzen. [**Formation of reserves in agricultural crop plants.**] *Experientia* **3.** pp. 32. 1947. [Eidg. Landw. Versuchsanstalt, Zürich-Oerlikon] **791**

There is diversity of storage materials in different parts of cereal grains ; fructosans in the young caryopsis (a temporary accumulation), sugar in the embryo, and mostly starch in the ripe grain. In the growing wheat grain non-protein amino acids are present in considerable amounts, but in the ripe grain, gluten is present in large quantities. The quality of the gluten is a genetical character and therefore an important factor in breeding wheat for bread making. The ripe embryo contains asparagine.

Quality depends on relationship between carbohydrate and nitrogen compounds. Climatic factors are largely responsible for development of vegetative organs and storage and manufacture of carbohydrates. Climatic factors also limit the possibilities of modifying chemical composition by breeding and by cultivation methods.—D.B.

FRICKE, E. F. **Molybdenum deficiency in oats.** *J. Aust. Inst. agric. Sci.* **13.** 75. 1947. [Dep. Agric., Tasmania] **792**

In certain areas of northern Tasmania, the Algerian variety of *Avena sativa* has shown symptoms known as " Blue Chaff disease." Affected parts of a field contain plants with pinched grain and often the whole area must be cut for hay. The disease is attributed to molybdenum deficiency on these soils and dressings of 2 oz. per acre of soluble molybdate have proved sufficient to counteract this grain malformation.—M.E.E.

SÁENZ de JUBERA, A. de A., and NAUNDORF, G. La influencia de las hormonas vegetales sobre el arroz. Ensayos iniciales sobre tratamientos con substancias de crecimiento, y productos con carácter de substancias de crecimiento, durante las primeras fases del desarrollo del arroz. [**The influence of vegetal hormones on rice. First essays on treatment with growth substances and products with a character of growth substances, during the first stages of development of rice.**] *Bol. Inst. Invest. Agron.* No. 16. 125-87. 1947. **793**

The work refers to the influence of treatments with growth substances on rice of the " Precoz verde " variety. The following substances have been employed : Auxin (extract of urine and maize), bios (extract of yeast), *B*-indoleacetic acid, *B*-indolebutyric acid, α-naphtalene-acetic acid (their salts of potash), the vitamins, A, B_1, C, D and E and a few animal hormones. These substances were employed in different concentrations, one at a time, mixed with each other and with addition of other substances (supplementary substances, manganese salts, glucose, etc.). An increase of speed of germination, of the growth of the coleoptiles, of the production of roots, of the formation of collateral roots, of the total length of the roots and of the growth of sprouts was obtained by the treatments.

It was shown that the " Precoz verde" rice does not contain auxin necessary for its growth in an optimal quantity. A good share of the results obtained should be explained by this fact. The possibilities for a commercial use of the growth substances are discussed. The results obtained do not show, so far, any definite increase in crops or in quality.—From Author's summary.

DARLINGTON, C. D. and CHATTERJEE, D. **Wild and cultivated rice.** *Nature, Lond.* **160.** 756-7. 1947. [John Innes Hort. Inst., London, S.W.19 (C.D.D.) and Roy. Bot. Gardens, Kew, Surrey (D.C.)] **794**

Correspondence between the authors is published with regard to the classification of *Oryza* spp. on the basis of chromosome numbers. [See also *Field Crop Abstr.* 1. Abs. 211.]—M.H.

MOORMANN, B. Untersuchungen über Keimruhe bei Hafer und Gerste. [**Dormancy in oats and barley.**] *Kühn-Arch.* **56.** 41-79. 1942. [Received 1947] **795**

Temperature is an important factor in breaking dormancy ; the older the seed, the higher the temperature, where after-ripening is complete ; but in earlier stages of maturity it is low temperature that is important, an increase in germination from 0 to 60-70 per cent being obtained by frost treatment.

The action of acid combined with injury to the seed coat is effective in breaking dormancy because it increases the gas exchange within the seed, lack of which is one cause of dormancy. Solutions of salts such as chlorides, nitrates, and sulphates in some cases gave weak results ; the only effective salt was sodium tungstate possibly because it favoured breaking up of the sugar molecule in the seed. The effect of growth substances such as heteroauxin, bios (growth substances from yeast), and vitamin C were so variable as to be valueless.

Dormancy is due to two groups of genes, one of which determines the structure of the seed coat, the other determines the nature of the embryo. With the former (being purely maternal) segregation takes place a generation later than in the latter. In a cross such as Cape × Coast in which both groups are effective, dormancy is very strong.—D.B.

VINES, A. **Studies on the germination of barley grains.** *Aust. J. exper. Biol.* **25.** 119-26. 1947. [Waite Agric. Res. Inst. Univ. Adelaide] **796**

Germination tests with ten barley varieties harvested when mature to determine their relative dormancy and the length of the "after-ripening" periods. Developing grain is able to germinate when very immature but with progressive ripening it enters a dormant stage. After this period, increasing germination accompanies the process of "after-ripening" until normal germination is reached and the seed is fully mature.—G.M.H.

SAHADEVAN, P. C., and NARASINGA RAO, M. B. V. **Notes on the deterioration in germination-capacity of a paddy strain in Malabar and South-Kanara.** *Curr. Sci.* **16.** 319-20. 1947. [Agric. Res. Sta., Pattambi] **797**

Investigations to find a simple and effective method of overcoming the defect of loss of viability of Co. 3 strain of rice seeds (Coimbatore *Vellai samba*) stored in receptacles which are not air tight. This strain, cultivated in Malabar and South-Kanara, is sown in August-September and harvested in December-January. Locally the harvested grains are dried and stored in straw-twist bundles or other non-air-tight receptacles till the time of next sowing in August-September. The seeds thus pass through the wet weather period of the south-west monsoon which usually records about 60 to 80 inches of rain in the two months of June and July and deteriorates as indicated by low germinability.

It was found possible to establish a fairly close correlation between the deterioration in the germination and the capacity of the grains to germinate immediately after harvest, with a value for $r = \pm 0.7968$. Deterioration could be very successfully checked if seeds were soaked in water for about 5 months and immediately dried, taking care to see that they do not dry to excess. From 80 to 100 per cent germination was obtained this way. The treatment, as simple as it is effective, does not affect the yield, either of grains or straw, of the succeeding crop.—G.M.H.

HUTCHINSON, J. B., GREER, E. N., and BRETT, C. C. **Resistance of wheat to sprouting in the ear: preliminary investigations.** *Emp. J. exp. Agric.* **16.** 23-32. 1948. **798**

Unfavourable climatic conditions at harvest time are conducive to sprouting of wheat. Sprouted grain is unsuitable for seed or for the manufacture of straw, the tendency to sprout being more prevalent among white wheats. Red wheats show marked resistance under similar circumstances. On the assumption that resistance factors were related to the dormancy of the grain at harvest, methods of testing the dormancy at this time have been studied. Considerable variation in the extent to which they show dormancy at similar periods of ripeness, and in the length of their post harvest investigation periods is noted among varieties. Germination tests at 23°C have shown more clearly defined differences between varieties than at 15°C. Field tests on the germination of grain in the ear have given similar results with the laboratory tests made at 23°C.—G.M.H.

BUCKWHEAT

JACQUES-FÉLIX, H. *Fagopyrum* spontané en pays tropicaux et possibilités de culture. [**Fagopyrum occurring wild in tropical countries and the possibilities of its cultivation.**] *Rev. Bot. appl.* **27.** 286-90. 1947. **799**

The species considered are *F. esculentum* and *F. ciliatum*. The latter is the only representative of the genus in tropical countries and grows in high altitudes. The grain could be used for food. Improvement either by cultivation or by hybridization might render the plant suitable for cultivation. The high altitude zones should be suitable for the introduction of *F. esculentum*.—D.B.

LEGUMES AND GRAIN LEGUMES

XOLOCOTZI, E. H. Los frijoles y otras Leguminosas cultivadas en Chiapas. [**The beans and other of the Leguminosae cultivated in Chiapas.**] *Bol. Soc. bot. México* **5.** 4-6. 1947. **800**

Phaseolus is the legume most commonly grown in the Mexican state of Chiapas. It is represented chiefly by *P. vulgaris* but also by *P. multiflorus* (temperate regions), *P. acutifolius* (tropical, humid zone), and *P. lunatus*, which is characterized by a large number of forms differing from one another in the colour, size and shape of the grains. Some of the colours seen are white, black, red, white with black spots, white with red spots, and red with white spots. The genus *Vicia* is represented by *V. faba*, grown in small quantities in the temperate zone, in the Cerro Malé region by a form with small, brown grains, probably *V. faba* var. *microsperma*. *Canavalia ensiformis* is grown to a small extent, and various wild spp. of *Canavalia* are found in the tropical parts of the State. *Cajanus indicus*, *Pachyrrhizus* (one cultivated and several wild spp.), *Dolichos* (*D. lablab* and a black-seeded species grown for ornament), *Vigna*, and *Crotalaria maypurensis* are also found.—G.M.R.

SOPER, M. H. R. **Beans for young sowing.** *J. Minist. Agric.* **54.** 511-14. 1948. [Dept. Agric., Univ. Oxford] **801**

It is still probably true that beans are the most valuable form of protein that can be grown at home as they provide a concentrate food, and one that is suitable for all classes of stock, young and old.

Full details are given on the characteristics of the spring type of bean, cultivation methods, liming, manuring, the value of early sowing, seeding, varieties, harvesting, and chocolate spot infection. The advantages of growing the crop mixed with oats are that the spread of aphis and chocolate spot appears to be greatly restricted, that the total yield is usually greater than from each crop grown separately and that in a bad year, the crop stands better than oats alone.—G.M.H.

HIGGS, C. **The East African Groundnut Scheme.** *Fmr StkBreed.* **62.** 346-7, 406-7, 464-5. 1948. **802**

A report in three instalments of a brief survey of the Tanganyika groundnut area, carried out between Jan. 3rd. and 23rd. The tropical environment, land clearing, groundnut cultivation, and some of the difficulties involved are described.

Windrows of scrub are bulldozed along the contours to prevent erosion; root clearance by three and four-tined rooters, similar to subsoilers on a common drawbar, follows. Disk harrows are followed by four-row 28 in. spaced Massey-Harris combine planters fitted with long tapering shoes. The groundnuts are shelled mechanically and though 6 in. apart, as first planted, low germination caused the distance to be reduced to 3.5 in. Fertilizer is applied near but not in contact with the seed. Some of the drilling is reported as being rough and it is unlikely that a high average yield will materialize. Difficulties in row-crop cultivations are forecast, two of which are necessary, one for the eradication of weeds and the other to suit the peculiarities of the groundnuts.

Inter-row work is being done by forward-mounted cultivators and trials are being made with a six-row double disk planter. Much weed was destroyed by crossing with a weeder. This machine, 15 ft. wide, consists of light springy tines arranged like teeth on the side of a rake. The teeth disturb the seedling weeds without affecting the nuts.—G.M.H.

LAMMERS, R. P. Kwaliteitsvraagstukken bij consumptiepeulvruchten. [**Problems of quality in pulse grown for food.**] *Landbouwk. Tijdschr.* **60.** 34-40. 1948. **803**

Aspects considered include the effect upon field-grown peas and beans of different manurial treatment, time of harvesting (preferably before maximum grain weight is reached), and harvesting methods. Of frames used for drying in the field, those with four feet are preferred to tripods, as being steadier.—G.M.R.

СОКОЛОВ, Г. М. Культура люпина на Урале. *Совет. Агрон.* 1947. *No.* 3. стр. 107-11.

SOKOLOV, G. M. [**Lupin in the Ural area.**] *Sovet. Agron.* 1947. No. 3. pp. 107-11. **804**

The value of *Lupinus* for green manure in areas of low soil fertility is stressed. Observations have been made in the Sverdlovsk and Molotovsk regions on suitable cultural measures under varied conditions. The best preceding crops are potatoes or rye, and oats are the worst. As the summer is short in the Urals, measures which shorten the vegetative period are most valuable. The data include yields obtained from (1) scarified seed, from vernalized seed and seed selected according to specific weight; (2) different sowing dates and planting distance; (3) varied sowing rates; and (4) fertilizer applications.

Vernalization of seed shortens the vegetative period by 11 to 16 days, increases yield and improves grain quality. In the Urals, under the conditions prevailing in 1942 and 1943 the optimum sowing date was the middle of May. The most suitable sowing rate is 175 kg. per ha.—M.H.

LAMBERTS, H. **Some remarks on sweet lupin.** *Fmg* **2.** 90-1. 1948. **805**

A short account of the experimental work done on the breeding of the sweet lupin in the Institute for Plant Breeding at Wageningen.—G.M.H.

WEISS, M. G., WEBER, C. R., and KALTON, R. R. **The new Hawkeye soybean.** *Iowa Fm Sci.* **2.** 3-8. 1947. **806**

A new variety of *Soja max* was released to growers in the northern part of Iowa during 1947 and further supplies of this Hawkeye seed will be allotted as it becomes available. The cross was made between the Mukden and Richland varieties and the resulting soybean is as early as Richland, has the same ability to resist lodging, but yields about 6 bushels more per acre. It thus equals the Lincoln variety for yield and oil content and is proving suitable for all the northern Corn Belt States.—M.E.E.

MARSZEWSKA-ZIEMIECKA, J., NOWOTNÓWNA, A., and KLUKOWSKA, W. Szczepienie roślin motylkowych. Cz. 2. Szczepienie soi. [**The inoculation of leguminous plants. 2. Soybean inoculation.**] *Mém. Inst. polon. Écon. rur.* **17.** 235-86. [English summary, pp. 285-6.] 1939. **807**

The memoir was presented for publication in May, 1938. During 1932-5, tests were made to determine the most suitable strains of *Rhizobium japonicum* for varieties of *Glycine soja* on Polish soils. The crop is said (in 1938) to have been only recently introduced into Poland and failures in establishment are attributed to deficient acclimatization.—M.H.

RAHMAN, S. A., DE, S. S., and SUBRAHMANYAN, V. **Effect of different treatments on the removal of hydrocyanic acid from the Burma bean** (*Phaseolus lunatus* **Linn.**). *Curr. Sci.* **16.** 351-2. 1947. **808**

There is information on hydrocyanic acid content of food preparations from the bean, and the amounts of HCN in the different varieties now on the market. The Double White (Butter bean) contains 90-160 ppm. of HCN, the Single White 100-300 ppm., the Chocolate Brown (Sultani) 90-140 ppm. and the Speckled variety 150-350 ppm.—M.H.

UPPSALA, Lantbrukshögskolans Baljväxtlaboratorium. Medd. 10. Betning och ympning. [**Disinfecting and inoculating.**] By *G. Bjälfve.* 1947. pp.13-6. **809**

Where inoculated peas were sown together with non-disinfected oats, nodule formation was abundant. Where inoculated peas were sown together with disinfected oats (when 18 different disinfectants were used) nodule formation was considerably poorer : it was also much delayed—3 weeks after sowing there were no root nodules on the pea plants in the half of the experiment with disinfected oats.—R.P.J.

PEAT, S., BOURNE, E. J., and NICHOLLS, Mary J. **Starches of the wrinkled and the smooth pea.** *Nature, Lond.* **161.** 206-7. 1948. [A. E. Hills Laboratories, Univ. Birmingham] **810**

Observations which have been made on the chemical composition of pea starch may influence current views on the part played by this polysaccharide in plant metabolism. In most of the common starch-bearing plants, the difference in starch grain form (characteristic of the plant or plant organ) is not reflected in the chemical composition of the starch, that is, in the relative proportions of the amylose and amylopectin components. Most cereal and root starches are composed of 20-30 per cent amylose and 70-80 per cent amylopectin. Until recently the only exceptional starches which had been examined were those of the waxy (or glutinous) variety of cereals. Hilbert and MacMasters (*J. Biol. Chem.* Vol. 162. p. 229, 1946) showed that wrinkled pea starch contained a higher percentage of amylose (60-70) than any hitherto examined. The present authors have confirmed this.

Although wrinkled pea is regarded as the type (*Pisum sativum*) and the smooth pea as the variation (*P. arvense*), the reverse may be true and the wrinkled pea may be the product of artificial breeding. The following table shows the salient differences between the starches of the two species.

Pea variety	Protein free starch	
	Amylose %	Amylopectin%
Wrinkled (Steadfast)	98	2
Smooth (Early Bird)	29.4	65.8
Smooth (Pilot) ..	30.2	66.1

—M.H.

REDDI, K. K., and GIAI, K. V. **Influence of variety, manuring and germination on vitamin B$_1$ content of groundnut** (*Arachis hypogea.*). *Curr. Sci.* **16.** 285. 1947. [Dept. Biochem., Indian Inst. Sci., Bangalore] **811**

Groundnuts are a very rich source of vitamin B$_1$. Among 40 varieties analysed wide differences in their vitamin B$_1$ content (5 to 20 per grm. of defatted flour) were noted, differences attributable mainly to varietal differences since all other conditions under which they were grown were identical. Plot experiments to study the influence of organic and artificial fertilizers on vitamin B$_1$ content of groundnut showed no significant differences in the B$_1$ content under the different treatments. —G.M.H.

OIL CROPS

BLACKMAN, G. E. **What is the future of linseed ?** *Fmr StkBreed.* **61.** 2859. 1947. **812**

A discussion of the possibilities of linseed as a permanent feature of British agriculture, viewed against production and farming methods prevailing in the world's largest producers of the crop (Argentine, USSR, India, etc.). Ten to twelve bushels per acre is taken as the average maximum production attainable in these countries while a mean yield of 22-26 bushels per acre could be expected in Britain. Linseed has too frequently been put in late as a last resort, resulting in uneven germination and seedlings being attacked by flea beetles, to be finally finished off either by weed competition or May drought. With early sowing in late March on a well prepared and clean seed-bed, linseed in southern England can yield well in excess of 1 ton per acre. Once weed competition has been removed still higher yields should be attainable. The cool English climate with its even distribution of rainfall means that flax rust and pasmo, two important diseases associated with higher temperatures, do not present the same problems here as in America. There is therefore wider scope for future selection of varieties to suit our particular needs and conditions.

The best ways of harvesting and threshing the crop have yet to be perfected while the possibilities of combine harvesting, both in relation to combining dried and using a pick up, require study. Surplus straw might well be used in the papermaking industry.—G.M.H.

HACKBARTH, J. Die Ölpflanzen Mitteleuropas. [**The oil plants of central Europe.**] 25 × 15. pp. 378. Stuttgart : Wissenschaftliche Verlagsgesellschaft m.b.H. 1944. [Received 1947] **813**

In the decade before the second world war the extension and development of oil crops was part of German policy for ensuring the supply of fats.

This theme is developed in the two introductory chapters. The important part of the book deals with the individual oil plants. For each there is an account of the systematics, morphology, cytology, cultivation, manuring, sowing, husbandry, diseases, pests, yields, seed storage, breeding, varieties, the oil (its properties and uses), and accessory uses of the crop. Some of these plants are oil plants in the restricted sense of the word (*Brassica napus oleifera*, *B. rapa oleifera*, *Papaver somniferum*, *Helianthus annuus*, *Sinapis alba*, *B. nigra*, *Camelina sativa*, *Carthamus tinctorus*, *Cyperus esculentus*, *Eruka sativa*, *Raphanus oleifera*, *Ricinus communis*, *Madia sativa* and *Nigella sativa*). Another group consists of oil bearing plants which have several other uses (*Linum usitatissimum*, *Cannabis sativa*, *Glycine hispida*, *Lupinus albus*, *Cucurbita maxima*, *Zea mays*, *Juglans regia* and *Corylus avellana*). Oil is a secondary product in *Vitis vinifera*, *Nicotiana tabaccum* and *Solanum lycopersicum*. These and many other plants from which oil is obtained are dealt with in less detail.

At the end of the book are tables of sowing dates, and of properties of the oils produced. There is a good index. The monograph is suitable for the agriculturist, the chemist and the plant breeder.—D. Brown.

FARRINGER, D. E. **Sesame.** *Soybean Digest* **8.** 12-7. 1947. **814**

Sesame has become an important oil crop in the Western hemisphere only within the last decade but has been grown in Asia since ancient times. World production in 1945 was estimated at nearly 1.5 million tons, China producing about half the world total, India supplying about one-third and Latin America and Africa the remainder. Though a relatively minor crop, sesame seeds and oil have a variety of uses, as for example in the manufacture of margarine and soap.

Sesamum indicum is the most important species cultivated in tropical and subtropical regions. A description of this erect annual, its soil and climatic requirements and the difficulties associated with the harvesting of the plant are given together with detailed notes on farming for the crop in Mexico, Nicaragua and South America. Only experimental plantings of sesame have been made in the south of the U.S.A. and in California and Arizona. Highly fluctuating yields, the undesirable shattering characteristic of the seed capsules and the need for large quantities of hand labour, especially at harvest time have caused a lack of interest in the crop in U.S.A.—G.M.H.

ARGENTINE REPUBLIC, Ministerio de Agricultura, Dirección de Informaciones. Pub. Misc. No. 234. El cultivo del lino para aceite en Argentina. [**The growing of oil flax in Argentina.**] By *H. Grieben* and *P. J. A. Lamas*. 1947. pp. 32. [Dir. Cereales, Lino y Forrajes, Dir. Gen. Agric., Min. Agric., Buenos Aires] **815**

Up to now, Argentina occupies the first place in the world for oil flax production, both as regards area and yield per unit area. The present pamphlet is intended to supply the Argentine grower with information enabling him to obtain more remunerative crops. A short botanical description of the plant is first given, in which, among other things, the importance of the size of the seed for the percentage and quality of the oil is noted. A positive correlation exists between thousand grain weight and percentage oil, and a negative correlation between thousand grain weight and the desiccative quality of the oil. The pamphlet then deals with production in different parts of Argentina, the type of climate and soil suitable for the culture, the place of oil flax in the cropping system (lucerne-maize-oil flax is given as an example of a good sequence), the seven varieties recommended for use and the regions for which they are adapted, tillage, seed quality, time of sowing and seeding rate, cultivation, harvesting (the combine is preferable as being the most economical means, provided the stand is clean and uniformly ripe and the weather is dry), storage, diseases, pests, weeds, use, costs of production, and standard requirements in regard to purity, etc.—G.M.R.

SPANGENBERG, J. S. El cultivo del lino en la zona Rosafe. [**The cultivation of oil flax in the Rosafe zone.**] *Almanaque Min. Agric. Argent.* **22.** 297-300. 1947. **816**

In the Argentine region in question the area occupied by oil flax (*Linum usitatissimum*) reached a peak at 3.5 million ha. in 1938, but since then it has steadily fallen and was only 1,853,900 ha. in 1945. While this was mainly due to the closing of the world market by the war, now that the market is once more open the crop is not being taken up again to the same extent, the farmer preferring to grow first wheat, then maize, and flax only in the third place. The reason generally given is that the soil " does not respond to flax." The present article points out that the lack of response is practically entirely due to the lack of a suitable crop rotation. Flax should never be grown in the same place until 6 or 7 years have passed. Advice is given on planning a rotation so that an adequate response shall be obtained from the flax sowing, with notes on the time and methods of sowing and seeding rates for the Rosafe region.—G.M.R.

VENEZUELA, Ministerio de Agricultura y Cria. Bol. No. 2. El ajonjoli (*Sesamum indicum* L.), su cultivo, explotación y mejoramiento. [**Sesame** (*Sesamum indicum* **L.**)**, its cultivation, use, and improvement.**] By *D. G. Langham* and *M. Rodriguez*. Caracas, 1945. pp. 134. pls. [Dept. Genetics, Inst. Exp. Agric., El Valle D.F., Venezuela] **817**

Sesame has been acquiring more importance in South and Central America of late years. Ideal conditions for its cultivation exist in Venezuela, and the Ministry of Agriculture is encouraging the extension of this culture by means of breeding, propaganda, and assistance in the provision of suitable machinery. The conditions under which it succeeds best in Venezuela are well-drained, sandy soils, altitude of 0 to 600 m., temperature of 25° to 45°C. with an absence of cold nights, and rainfall of 500 to 800 mm. evenly distributed over the growing season. The principal varieties grown up to the present are (1) the so-called native variety, many-branched, hardy, vigorous, late, having seeds with good percentage of oil, but only moderately productive and susceptible to aphid attack ; and (2) the variety " China," with a single stem, not much vigour, early, having more capsules per node and short internodes, resistant to aphid attack and productive. The Department of Genetics has now introduced other varieties from China, Nicaragua, Hawaii and elsewhere as breeding material. Breeding by means of selection and hybridization was begun in 1939.

The present bulletin may be divided into two parts, the first of which gives a fully illustrated account of methods of cultivation, common and improved, of diseases, pests, and methods of oil extraction in Venezuela ; while the second is concerned with achievements, problems, and experiments in the breeding of this plant. One striking finding is that in some thousands of crosses of different, non-related varieties, only one single case of hybrid vigour was determined. Work at the breeding station has also taken into account cultural problems such as the best time at which to harvest and to sow sesame.—G.M.R.

VELDE, A. J. van de. Cultivo del sésamo [**Cultivation of sesame** (*Sesamum indicum*).] *Almanaque Min. Agric. Argent.* **22.** 405-7. 1947. **818**

A short exposition is given of the uses, conditions and methods of cultivation of *Sesamum indicum*. Although primarily an Asiatic crop, sesame during recent years has been gaining in popularity in South America. The oil content of the seed, which fluctuates about 50 per cent, is higher than that of any other oil plant grown in Argentina and the oil, in addition to being of agreeable taste, does not become rancid on exposure to the air. Crops of 1 to 1.5 thousand kg. per ha. can be obtained in Argentina.—G.M.R.

BAJAI, J. Csökkenthetö-e a napraforgó elágazása a tenyészterület szabályozásával? [**The possibility of decreasing branching in sunflower by regulation of the growing area.**] *Agrar. Szem.* **1.** 515-9. [English summary, p. 519] 1947. **819**

The effect of decreased space between rows on branching capacity of the plants was studied. Spacing is not a factor affecting branching and the author maintains that measures to control or modify heritable characteristics through external factors of cultivation are futile.—M.H.

HOLLMANN, E. G. El cultivo del girasol en La Pampa. [**The cultivation of sunflower** (*Helianthus annuus*) **in La Pampa.**] *Almanaque Min. Agric. Argent.* **22.** 329-31. 1947. **820**

The light, sandy soils of the Argentine Territory of La Pampa are well suited to the growing of sunflowers. Advice is given on tillage, sowing and seeding rate, varieties (dwarf varieties and the use of seed certified by the Ministry of Agriculture are recommended), cultivation, harvesting (the average yield in La Pampa is 800 kg. but under favourable conditions it may be as much as 1200 kg. per ha.), diseases and pests, and the sowing of sunflowers as a catch crop in the stubble of wheat, rye, oats or barley immediately after the harvesting of the cereal.—G.M.R.

НАЛИВКИН, А. А. Декапитация подсолнечника на силос. *Совет. Агрон.* 1947. *No.* 3. стр. 112-4.

NALIVKIN, A. A. [**Decapitation of sunflower for silage.**] *Sovet. Agron.* 1947. No. 3. pp. 112-4. **821**

If sunflower plants were decapitated when 45-49 cm. high, the weight of stems increased (in centners per ha.) from 85.71 to 102.22 and that of leaves from 87.62 to 116.19, thus giving 26.01 per cent increase in the silage bulk. The method was most effective when the plants were decapitated at the phase of inflorescence formation, the total bulk increasing by 49.16 per cent and containing the most favourable ratio of leaves and shoots (34.92 per cent) and stems (65.08 per cent). With later decapitation the increase in the total bulk was smaller and the content of the stems much increased. Decapitation was particularly effective when the plants were grown on moist and well-manured soil.—M.A.O.

JOURNAL OF THE DEPARTMENT OF AGRICULTURE, ÉIRE. **Production of linseed.** *J. Dep. Agric. Éire* **44.** 72-9. 1947. **822**

The Department of Agriculture, Éire, conducted trials in the growing of linseed in the seasons between 1928 and 1944 and Instructors in Agriculture conducted trials at 73 centres during 1944 and 1945. A number of fibre-producing varieties, Argentine or Plate linseed and six linseed varieties procured from the U.S.A. in 1939, namely, Bison, Boley, Golden, Buda, Newlands, Redwing and Rio, were used in the trials. Yields were very variable and there was an unduly high proportion of failures and poor crops due mainly to lodging, weed growth or damage by vermin or birds. The more productive of the linseed varieties proved superior in respect of seed yield to the varieties grown in Ireland primarily for fibre production. Plate linseed was found to be generally less suitable for cultivation than the better of the other linseed varieties used —G.M.H.

BAGGE, H. Kulturforsøg med Oliehør. 1940-1945. [**Cultivation trials with oil flax 1940-1945.**] *Tidsskr. Planteavl.* **51.** 310-30. 1947. **823**

In an experimental series comprising 8 trials conducted from 1940 to 1943 distances between drills of 12, 24 and 36 cm. were tested at Lyngby and Aarslev. The wide spacing (36 cm.) has in all the trials given the smallest seed yield. A spacing of 12 cm. gave the best results in 1940 and 1943, and of 24 cm. in 1941 and 1942. At Lyngby spacings of 12 and 24 cm. have given the same seed yield, but at Aarslev the best results were obtained with a spacing of 24 cm. On the average of all the trials a spacing of 24 cm. has given 2 and 12 per cent larger seed yield than 12 and 36 cm. respectively.

Straw yield decreased from the smallest to the largest spacing. On the average the amount of straw harvested was 0.8 and 2.3 hkg. less with respectively 24 and 36 cm. spacings than with a 12 cm. spacing. The length of the straw was the same in all the trials.

The size of the seed increased with wider spacing, while the content of crude fat appeared to be unaffected.

Trials with different seed rates, 60, 85 and 110 kg. seed per ha. (power of germination about 95 per cent), were conducted at Lyngby, Tystofte and Aarslev. The two low rates (60 and 85 kg. per ha.) have at all three centres given about the same seed yield, and both on the average 14.9 hkg. seed per ha. or 0.4 hkg. seed per ha. more than the high seed rate. Growers are recommended to use a seed rate per ha. of 80—90 kg. seed with good germination, or if there is a possibility of utilization of the straw as spinning material of 100—120 kg. Date of sowing trials were conducted from 1941 to 1945 at Lyngby, Tystofte, Aarslev and Hornum.

The results indicate that oil flax should as a rule be sown in the middle third of April; only when it is desired to destroy weeds before sowing can postponement of the sowing date for ten to fourteen days be recommended.—R.P.J.

FRIEDERICH, J. C. De teelt van olievlas. [**The growing of oil flax.**] *Maandbl. LandbVoorlDnst* **5.** 12-20. 1948. [Netherlands Flax Institute] **824**

The author reviews the world production of oil plants from 1935 to 1946; the estimated production from 1947 to 1950; the development of oil flax (linseed) cultivation in different parts of the world from 1935 to 1946; cultural technique in North America and Denmark; and prospects and the technique advisable in the Netherlands. It need not necessarily be grown in those regions where flax for fibre is to-day successful, but rather in the fertile, moisture-retaining, sandy soils of the eastern provinces, where flax was formerly grown but abandoned because better fibre was obtained on the clay lands of the present flax areas. Advice is given on preceding crops, tillage, time, method and rate of seeding, varieties, manurial treatment, diseases and pests, harvesting and threshing.—G.M.R.

TIMSON, S. D. **The sunflower** (*Helianthus annuus*). *Rhod. agric. J.* **44.** 532-45. 1947. **825**

Four principal varieties of *Helianthus annuus* are cultivated in Southern Rhodesia. They are (1) the small-seeded Black Russian; (2) the large-seeded Black Russian; (3) the striped or common, with striped or grey seed; and (4) the white-seeded. The small-seeded Black Russian produces the heaviest seed and its weight per bushel runs to 40 lb. in Southern Rhodesia. The striped and large Black Russian comes next in weight, the bushel weight reaching about 36 lb.

There follows notes on the various industrial uses of the crop, chemical analyses of the seed, ash, and leaves, sunflower ensilage, sunflower in rotation and other information necessary for the successful cultivation and harvesting of sunflowers.—G.M.H.

CSAKY, T. Z. Az extrahált napraforgódara táplálkozásélettani értékérol. [**Nutritive and biological value of extracted sunflower meal.**] *Kisérl. Közl.* **47.** 49-56. [English and Russian sumaries, pp. 55-6.] 1947. [Hungarian Biol. Res. Inst., Tihany] **826**

The addition of maize to wheat flour diminishes the biological value of the flour, but the nutritional value of such mixed flour can be improved by including 20 per cent of extracted sunflower meal (rich in protein, tryptophane, lysine, lime and niacin).—M.H.

ALAM, Z., and AHMAD, S. **Effect of storage on rape-seed and rape-oil.** *Indian J. agric. Sci.* **16.** 279-84. 1946. [Punjab Agric. Coll. and Res. Inst., Lyallpur] **827**

Results reported represent the first attempt made in India to determine the changes that rape-seed and rape-oil undergo during storage. Dry, fully ripe, sound, fresh seeds of *Brassica campestris* var. *Koria*, *B. campestris* var. *dichotoma*, *B. trilocularis* and *B. juncea*, all of which are classed as rape-seed, were used in the studies. No deterioration occurred with respect to oil and nitrogen contents, when the seed were stored in bulk or in bags for a period of 2 years under good ventilation conditions.—M.E.E.

Jakobey, S. A magyarországi lenolajok összetétele. [**The chemical composition of Hungarian linseed oils.**] *Kisérl. Közl.* **47.** 41-8. [English and Russian summaries, pp. 47-8.] 1947. [Hungarian Oil-Plant Breeding Sta., Szeged] **828**

The oils of different varieties grown in the same area are similar, but varieties grown in different districts show different physical and chemical characteristics in their oils (independently of differences in soil type). When different flax varieties are grown at the same altitude, with uniform medium temperature, but under increasing rainfall, there is (again independently of soil differences) an increase in iodine and thiocyanogen numbers of the oils.—M.H.

FIBRE CROPS

Lugard, W. J. Katoen: historisch overzicht, botanische beschrijving, soorten, morphologie, physiologie, vezel-ontwikkeling en structuur, groeivoorwaarden en verbouw, ziekten en plagen, ginnen en kwaliteit-beoordeeling. [**Cotton: historical review, botanical description, varieties, morphology, physiology, fibre development and structure, growth conditions and cultivation, diseases and pests, ginning and judging of quality.**] 29 × 23. pp. 198. pls. New York: Commissie voor Nederlandsch-Indie, Suriname en Curacao; and 's-Gravenhage: Martinus Nijhoff, 1945. [Received 1948] **829**

Since cotton is cultivated successfully in almost every tropical and subtropical part of the world, it is somewhat surprising that the Netherlands Indies are not included among the cotton-growing countries. Actually, however, the culture is found sporadically only in some parts of Java and Sumatra, and for the most part it is still in the experimental stage. Trials have brought to light the fact that in these regions special, though possibly not insurmountable difficulties are encountered, chief of which are the distribution of rainfall during the growing and flowering seasons, insect pests, and fungous diseases. Cotton growing might well become of great economic importance to the Netherlands Indies, and the continuation of research and experiment is eminently desirable. It is with a view to contributing towards this end that the author has written the present monograph, which treats not only the botanical but also the agricultural and industrial aspects of the cotton plant. He discusses successively the history of cotton growing, the family Malvaceae and the genus *Gossypium*, species and varieties, the structure of the cotton plant, development from flower to fruit, growth and flowering, growth and structure of the cotton fibre, conditions requisite for cultivation, cultural technique, diseases, pests, ginning, and classification according to quality. In considering climate, conditions, and cultural technique, special attention is paid to the findings of the Cotton Experiment Station at Bambesa in the Belgian Congo, for the Congo is more comparable with the Netherlands Indies in conditions and cultural methods than are some other cotton-growing countries.

The text of the book is in Dutch, and it is illustrated by a large number of excellent plates. There is ample reference to the literature.—G. M. Roseveare.

Trought, T. **Cotton growing in Greece.** *Emp. Cott. Gr. Rev.* **25.** 29-34. 1948. **830**

The cotton growing areas are scattered throughout the country; Macedonia and the eastern half of what is known as "Continental Greece" are the most important areas; yet in spite of the differing conditions of soil and climate the actual cultivations of the crop do not vary much. Ploughing is done in the autumn, generally in October when suitable rain occurs. The land is then left to absorb the winter rainfall until a favourable day in February or early March, when a second ploughing is given. A third ploughing is done later in March or in April, before sowing starts in May. Where continuous cotton is grown, the first ploughing is left till spring.

The most usual sowing date is from the end of April till the middle of May, though experimental work at the Cotton Research Institute, Sindos, seems to show that the earlier the sowing in April, the better the yield in the western Macedonia area. Sowing is generally done by hand by a small single-row cotton drill, or dibbling as in the Argos district, where a small mattock-like hoe is used for making the holes into which the seed is dropped and then covered, or broadcast, which is the more general method in the Levadhia and Salonika districts.

The seed takes 7 to 10 days to germinate and when it is through the ground a number of careful and thorough hand hoeings are done to destroy weeds. Any thinning out of the cotton is done at the first hoeing, but on the whole, little importance is attached to spacing at present. This is one of the items which is under experimental investigation but until cotton is sown in lines the results cannot be of practical application. Picking begins in September and may go on till December and as a rule, four pickings are taken. On irrigated land (about 30 per cent of the cotton area was reputed to be irrigated) yield estimates of the farmers themselves were about 1100 lb. of seed cotton per acre. The "dry" land was expected to give about 400-450 lb. per acre.

Rehabilitation of the Greek cotton-growing industry will require, among other things, a revival and intensification of research in all aspects of cotton-growing. Practically every side of the work—plant breeding, plant physiology, plant protection, sowing dates, manurial requirements, cultivations (particularly mechanical cultivations and their effect on the soil structure) requires to be enlarged.—G.M.H.

AFZAL, M. **American cottons in India—their introduction and development.** *Indian Fmg* **7.** 457-62. 1946. [Cotton Res. Bot., Lyallpur] **831**

After several failures, the American cotton plant was, during the course of the 19th century, acclimatized in India and the beginning of the present century saw its spread on a very wide scale. The most important varieties at present under cultivation and their technological properties are described. In the Punjab, the varieites are 4F, LSS, 289F/K25, 289F/43 and Victory; in Sind, Sind Sudhar, M4, 289F and Sind 4F; in the United Provinces, in a small irrigated strip in the extreme west, Perso-American cotton; in Central India, American cotton is grown as a mixed crop, with the indigenous varieties; in the Central Provinces and Berar the variety is Buri; in Bombay Presidency, Gadag No. 1; in Hyderabad, Parbhani I and in Madras Presidency, Ordinary Cambodia, Co2, Co3, Co4, 920 Cambodia and X4463.—G.M.H.

LORD, E. **Shots in the dark. Some aspects of future cotton production.** *Emp. Cott. Gr. Rev.* **25.** 20-8. 1948. **832**

Some of the most important factors affecting future demands for cotton are broadly classified under three headings: (1) general world economic conditions; (2) cheapness of supply; (3) development of new, or improvement of present characteristics. Discussing the latter it is noted that there has been virtually no marked advances in developing new types of cotton with outstanding characteristics. The V 135 St. Vincent Sea Island provides one exception, being equal in fineness but appreciably longer than the best Sea Island cotton ever grown. The production of coloured cottons in the USSR (an idea used by the Incas of Peru) is a development of recent times but these types have yet to prove their commercial importance. With the more advanced methods of plant breeding and with the potential new material which may be derived from the uncultivated cottons and from interspecific hybrids the development of entirely new types of cotton is possible. Lines of research suggested, include a new species of which the lint is of commercially acceptable length, fineness and strength, but which is wholly or nearly free from convolutions; a cotton fibre which does not collapse after boll split into a flattened, twisted ribbon but which substantially retains a large hollow lumen (as in Kapok) or one having properties materially different from those of present cottons.—G.M.H.

LORD, E. **The production and characteristics of the world's cotton crops.** *J. Text. Inst.* **37.** 151-79. 1946. **833**

The first of a series of papers devoted to the growth and characteristics of the cotton produced in particular areas, in this case, the West Indies. A historical introduction with information on growth and conditions is followed by an account of the various cotton growing areas in the West Indies and notes on the varieties of cotton grown in each. A detailed discussion is given of the quality and characteristics of the separate strains based on the results of tests carried out over a period of many years at the Textile Institute. The opinion is expressed that the British West Indies are unlikely to increase the area devoted to cotton in the future. Many large areas are quite unsuitable for its cultivation, whilst disastrous consequence would arise if there was any great encroachment on the land now devoted to food crops.—G.M.H.

LORD, E. **The production and characteristics of the world's cotton crops. Part 2. Egypt.** *J. Text. Inst.* **38.** 167-211. 1947. **834**

The second of a series of papers devoted to the growth and characteristics of the cotton produced in particular areas. An historical account of cotton growing in Egypt and notes on the economic geography of the country are followed by brief descriptions of the origin and general character of all the varieties of Egyptian cotton which have appeared in appreciable quantities from 1860 up to the present day. Diseases and insect pests which produce serious injurious effects upon the Egyptian cotton plant and its products are given and also a resumé of the three major institutions dealing with research problems appertaining to Egyptian cotton. Fibre and yarn characteristics of the varieties now forming the main Egyptian crop are listed, Amon, previously known as Giza 39 in the early stages of its development, being considered the best quality cotton ever grown in the country on a commercial basis. Commenting on future development the author considers it unlikely that there will be a sudden increase in production to the average level prevailing immediately before the outbreak of war but expects instead a gradual increase depending on general world economic conditions, the rapidity of the re-establishment of the textile industries in different countries, and the speed at which land now devoted to the production of food may safely be turned over again to the cultivation of cotton.—G.M.H.

MACKIE, J. R. **The possibilities of increased production of cotton in Nigeria.** *Emp. Cott. Gr. Rev.* **25.** 4-11. 1948. **835**

Nigeria's contribution to the world's supply of raw cotton, averaging between 30,000 and 50,000 bales per season, is produced entirely by small-peasant farmers. Large-scale estate production has never been attempted. Cotton is grown throughout the whole of Nigeria except on the acid sands of the Eastern Provinces and long before there was an export trade in cotton, indigenous types were cultivated to provide the raw material for the local spinning and weaving industry. This internal demand is an important factor, in that cotton will always be grown as long as the internal demand exists. Therefore native production can always be expanded quite rapidly. The internal demand directly affects the types of cotton which are cultivated, in that to be successful a variety must be suitable for both the requirements of the local industry and for the European market. Allen's Longstaple, the type grown in Northern Nigeria meets both requirements and can be relied upon to yield fairly consistently year after year. The commercial crop consists of a mixture of strains but only the No. 26c selection has proved to be a very definite improvement. It is characterized by both a high yield and a high ginning percentage (37 per cent) and is now being multiplied for general distribution.

An assured supply of seed of a variety which is suitable for a very wide area is one of the main essentials for a rapid increase in cotton production. Allen is a successful type for all parts of Nigeria where guinea corn is the staple food crop, i.e. approximately as far south as the line of Lat. 9°N. South of this line where the yam becomes the staple food crop, insect pests and diseases are serious limiting factors and Allen has not been a success. The problems involved in increasing the production of cotton in this belt are much more difficult than in the Guinea corn belt for it will first be necessary to find a suitable cotton. As the belt covers a wide range of conditions it is probable that no one type will be suitable for the whole area, consequently quick results are hardly likely to be achieved. The very low yields obtained from a high percentage of native farms are usually due to the delay in both planting and weeding, as cotton has to take second place to food crops. Methods of increasing yields, especially by mixed farming systems are suggested.

The opinion is expressed that a substantial increase in cotton production by ordinary native methods is possible. It could probably be doubled in quite a short period of time. Essential steps to achieve this result are: (1) more and suitable consumer goods to provide the incentive for increased effort; (2) sufficient trained men in, and a concentrated effort by the Agricultural Department; (3) a price to the producer which will enable the export trade to compete with the local industry, thus encouraging the producer to produce a surplus for export; and (4) large-scale operations on estates under European management.—G.M.H.

MORGENROTH, E. Die geschichtliche Entwicklung und Fortschritte der Kultur und Züchtung der Baumwolle in Russland. [**The historical development and progress in the cultivation and breeding of cotton in Russia.**] *Kühn-Arch.* **60.** 315-36. 1943/44. [Received 1947] **836**

The ancient cotton cultivation regions are Turkistan and Transcaucasia; the new ones, opened up by the Soviet Union, are in the North Caucasus, South Ukraine and Crimea. The development and progress of cotton growing is traced from early times, through the period of the Czars, to that of the Soviet State between the two world wars. Since 1928 production has considerably increased. Cotton breeding in these regions is dealt with.—D.B.

HARVEY, A. D. **Flax—newcomer to Klamath.** *Reclam. Era* **33.** 254. 1947. [Klamath Falls Expt. Sta., Oreg.] **837**

The Klamath Basin of Oregon and California has a suitable climate for the production of *Linum usitatissimum* for seed according to recent varietal trials. Bison, Midland and Redwing varieties have produced good yields and frost-hardy varieties, such as Crystal, should produce even better results in the future. Present seeding rates of 40 lb. per acre have yielded 25 bushels of seed per acre. When planted in late April the crop delveloped in 4.5 months so that by early September the seed crop was ready to harvest.—M.E.E.

KIRBY, R. H. **Jute and its substitutes: possibilities of production in the Colonial Empire.** *Bull. imp. Inst.* **40.** 97-131. 1947. [Intell. Sect., Plant and Animal Prods., Dept. Imp. Inst.] **838**

India produces about 97 per cent of the world's jute. Her annual production during this century has varied from 1,000,000 to 2,000,000 tons, requiring from 2,000,000 to 3,000,000 acres. Briefly the conditions required for jute cultivation are: (1) high temperature; (2) deep soil of fairly fine texture; (3) rainfall of over 40 in., so distributed that while the young plants have enough moisture, the bulk of the fall takes place when the crop is mature; and (4) sufficient supply of clear running water. Two species of jute are grown, *Corchorus capsularis* and *C. olitorius* and as a result of experimental work two improved types "D 154" and "Chinsurah Green" have been evolved from *capsularis* and from *olitorius* respectively. In 1937-38 it was estimated that the improved varieties were under cultivation on about 80 per cent of the total acreage in Bengal. Other details of jute cultivation are given under the heading of manuring, preparation of the fibre, water supply, price and storage.

The various attempts to grow jute elsewhere in the British Empire are reported, followed by notes on jute substitutes, such as cotton paper, and synthetic fibres ("Fibro"). Other important fibres which have been used in place of jute are *Urena lobata*, various species of *Hibiscus* and Caroa fibre (*Neoglaziovia variegata*). A short account of the cultivation, etc., of each of these fibres is given as a guide for those interested in their possibilities. —G.M.H.

CAMERON, G. S. **Bulletin for cotton growers** *Rhod. agric. J.* **44.** 498-508. 1947. [Cotton Research and Industry Board] **839**

Details on choice of land, preparation of the soil, planting, use of depth regulators and machine planters, thinning out, cultivation and weeding, harvesting and other information required by the prospective cotton-grower in Rhodesia.—G.M.H.

КОСТЯКОВ, А. Н. и ЕРОХИН, А. Д. Повышение урожаев хлопка в Средней Азии. Материалы 9 пленума Секции Гидротехники и Мелиорации, Всесоюз. Акад. С-Х. Наук. Москва, 1941. стр. 104.

KOSTJAKOV, A. N., and EROHIN, A. D. [**Increased yields of cotton in Central Asia. Papers read at the 9th Meeting of Sect. Hydrotechnics and Melioration, All-Union Acad. Agric. Sci. USSR.**] Moscow, 1941. pp. 104. **840**

This publication contains papers read at the above Meeting held at Taškent in 1939. The subjects discussed included problems of herbage rotations and cultural measures in cotton production, with special reference to measures for controlling soil salinity under systems of irrigation.—M.H.

NEW MEXICO Agricultural Experiment Station. Bull. 340. **Maintaining cotton yields.** By *G. Staten* and *D. A. Hinkle*. 1947. pp. 15. **841**

The yield data from fertilizer and rotation tests conducted at the State College is reported. For all tests on the various soil types there was an average increase in yield of 0.39 lb. of lint cotton per pound of available nitrogen applied alone, 1.134 lb. of lint cotton per pound of combined available nitrogen and phosphorus and 27.6 lb. of lint cotton for each ton of manure applied. Where fertilizer is needed, it is recommended that about 40 lb. of available phosphorus combined with 60-100 lb. of available nitrogen per acre be used, except on heavy land or land that has recently been heavily phosphated.

Alfalfa and similar legumes such as sweet clover and sour clover tended to increase cotton yields in most cases; cowpeas, soybeans and sesbania did not produce profitable increases in yield when a full crop year was devoted to their production. It is noted that in some cases, excessive vegetative growth and poor fruit setting occurred on cotton immediately following alfalfa and sweet clover.—P.M.

FREDERIKSEN, P. S. Dyrkning og Oparbejdning af Spindhør i Holland, Belgien og Nord-Frankrig. [**Cultivation and working up of fibre flax in Holland, Belgium and North France.**] *Ugeskr. Landmn.* **92.** 807-11 and 823-7. 1947. **842**

These three countries now constitute the world's finest fibre flax area. A map is included showing that cultivation is carried on mainly in the coastal areas where the best soil is found. The place of fibre flax in the rotation is usually after a cereal crop. In Holland oats and wheat are considered to be among the best preceding crops and peas one of the poorest. The most common Dutch rotations with fibre flax are:

1. Sugar beets/peas/wheat/potatoes/vetch/oats/fibre flax.
2. Peas/winter barley/clover/sugar beets/wheat/fibre flax.
3. Barley/clover/sugar beets/wheat/oats/fibre flax.

Fibre flax is never grown immediately after clover-grass or other legume-containing crops.

Although the same rate of seeding is used in Denmark, there are many more plants in Belgian, French and Dutch fibre flax fields than are generally found in the Danish fields; this is due to careful preparation of the seed bed. A detailed description is given of the methods of harvesting and of working up the crop employed in the three countries. It is considered that particularly as regards cultivation, Denmark would be well advised to work on the same lines as those followed in the West European countries.—R.P.J.

IOWA Agricultural Experiment Station. Res. Bull. 352. **Soil type and soil management factors in hemp production.** By *A. J. Yessel* and *C. A. Black*. 1947. pp. 384-424. **843**

Yields of *Cannabis sativa* were varied considerably by growing the crop on different soil types during experiments in several north central States. Preceding crops also affected hemp yields with the following relative productions: clover or lucerne 100, soybeans 75, oats or maize 57, sorghum 35. These residual effects were related to the level of available nitrogen in the soil. Cultural practices and seeding methods had only slight effects on yields of hemp.—M.E.E.

AGUERRE, R. O. El cultivo del algodón de fibra larga al noroeste de Catamarca. [**The cultivation of long-fibred cotton in the north-west of Catamarca.**] *Almanaque Min. Agric. Argent.* **22.** 201-2. 1947. **844**

A preliminary report is given of trials of seven varieties of long-fibred cotton (*Gossypium barbadense*) begun at the Experiment Station, Andalgalá, in 1944 and still in progress. Results up to the present show that this valuable cash crop, already grown in the valley of Catamarca, is suitable also for considerable areas in the north-western part of the province, where climate, soil, and the existence of irrigation facilities offer favourable conditions. The best time to sow in this region is between 20th September and 15th October. Harvesting continues until the end of June. The seven varieties under trial were encouraged by 145 mm. rainfall, 977 mm. irrigation, and seven cultivations during the growing season. The first year's yield ranged from 2700 to 3350 kg. per ha., but it will probably be possible to increase this yield.—G.M.R.

BROWN, C. H. **Egyptian cotton-breeding technique.** *Emp. Cott. Gr. Rev.* **25.** 35-7. 1948. [Cotton Res. Board, Giza, Oiman, Egypt] **845**

Notes on recent changes in the Egyptian crops and techniques of work. The main types of commercial importance so far put on the market are Karnack (Giza 29), Menufi (Giza 36), Amon (Giza 39) and Giza 30. Giza 30 is the first of a new series of introductions of medium-staple varieties even higher than Zagara in yield, and therefore higher, as far as is known, in intrinsic yielding ability than any Delta types previously grown.—G.M.H.

BĂLAN, I. M. Rezultatele experienţei cu diferite distanţe la bumbac din anii 1939-1944 dela Staţiunea Experimentală Agricolă a Bărăganului. [**Results of trials on planting distances for cotton at the Bărăgan Agricultural Experiment Station during 1939-44.**] *Anal. Inst. Cerc. Agron. Român.* **17.** 3-44. [French summary, pp. 26-7.] 1945. **846**

Field trials have been confined to the above Station which at present is the only one located in the southern part of the country where climatic conditions are favourable for the crop. A reduction in planting distances, from 40—30 cm., or from 60—20, 60—40 cm. between rows and pockets gives the best yield and the earliest maturity in the region concerned.—M.H.

ВЕЛИЕВ, И. М. Выведение вилтоустойчивых сортов американского хлопчатника. *Совет. Агрон.* 1947. *No.* 3. стр. 90-1.

VELIEV, I. M. [**The production of wilt-resistant varieties of American cotton.**] *Sovet. Agron.* 1947. No. 3. pp. 90-1. **847**

Following a brief description of selection work on this problem, the variety 01363 is considered outstanding among industrial varieties of American cottons which are resistant.—M.H.

МАКСИМЕНКО, И. К. Новые сорта хлопчатника. *Совет. Агрон.* 1947. *No.* 3. стр. 84-9.

MAKSIMENKO, I. K. [**New varieties of cotton.**] *Sovet. Agron,* 1947. No. 3. pp. 84-9. **848**

The long-staple cotton variety 54761 belongs to *Gossypium barbadense* (Egyptian type). Compared with the American type, *G. hirsutum*, it has a long vegetative period. In USSR, experiments have been made to produce varieties with the more desirable characteristics of the Egyptian type. The varieties are recorded as Soviet long-staple cottons. (See *Plant Breeding Abstracts.*)—M.H.

ALPWIRTSCHAFTLICHE MONATSBLAETTER. Die Verarbeitung der Fasenpflanzen in des Fabrik. [**The processing of fibre plants in the factory.**] *Alp. MBl.* **12.** 391-3. 1947. **849**

The delivery of flax and hemp for manufacture through the agricultural association has proved to be most advantageous, reasons for which are given. Within a year the product is returned either as linen cloth or as linen thread for weaving at home.—D.B.

KHAN, A. H., and AFZAL, M. **The use of seed from different pickings of the cotton crop.** *Emp. J. exp. Agric.* **16.** 39-46. 1948. [Cotton Res. Lab., Lyallpur, Pakistan] **850**

Experiments show that neither the earliness of the cotton crop nor the yield suffers by the use of seed from early or late pickings and that it is more economical to use this seed for sowing rather than from the middle pickings.—G.M.H.

EWING, K. P., PARENCIA, C. R. Jr., and IVY, E. E. **Cotton-insect control with benzene hexachloride, alone or in mixture with DDT.** *J. econ. Ent.* **40.** 374-81. 1947. [Texas Agric. Expt. Sta.] **851**

Boll weevil, cotton aphid and cotton leafworm were adequately controlled in *Gossypium* sp. by applying benzene hexachloride dust containing 5 per cent of the gamma isomer, but this insecticide gave no control of the bollworm. Mixtures of 5 per cent DDT and benzene hexachloride, however, gave effective control of all pests including bollworm, and proved more reliable than DDT alone. In field and small-plot experiments the treated plants gave greater yield increases of seed cotton as compared with the untreated controls. During late-season large-scale experiments the DDT-benzene hexachloride mixture induced rapid recovery of the plants even where they were heavily infested with pests and practically devoid of fruit. The action of calcium arsenate and nicotine in lime on pest-infested cotton plants was also studied in relation to the main insecticides.—M.E.E.

BECNEL, I. J., MAYEUX, H. S., and ROUSSEL, J. S. **Insecticide tests for the control of cotton boll weevil and cotton aphids in 1946.** *J. econ. Ent.* **40.** 508-13. 1947. [Louisiana Agric. Expt. Sta.] **852**

Field plot experiments were conducted in

Louisiana to test the compatibility of calcium arsenate and benzene hexachloride and to compare this combination with the recommended calcium arsenate-nicotine programme for the control of boll weevil and aphids in *Gossypium* sp. Results showed that 5.17 per cent gamma benzene hexachloride was necessary for efficient boll weevil control and this substance was not compatible with calcium arsenate. The seed yields of cotton were most easily maintained by using calcium arsenate plus 1 per cent nicotine as an insecticide. —M.E.E.

SMITH, C. E., and BECNEL, I. J. **Effectiveness of different forms of nicotine in cotton aphid control.** *J. econ. Ent.* **40.** 536-9. 1947. [Louisiana Agric. Expt. Sta., Baton Rouge] **853**

Three years of experimental pest control on *Gossypium* sp. grown in Louisiana showed that none of the nicotine preparations when mixed with commercial calcium arsenate interfered with this poison in controlling boll weevil. Aphids were more effectively controlled by the dry concentrate form of nicotine in a mixture with calcium arsenate. —M.E.E.

GAINES, J. C., and DEAN, H. A. **The relative toxicity of DDT and calcium arsenate to cotton leafworm.** *J. econ. Ent.* **40.** 454. 1947. [Texas A. and M. Coll., College Station] **854**

The toxicity of DDT was compared with that of calcium arsenate against the leafworm (*Alabama argillacea*) pest of *Gossypium* sp. Laboratory tests showed that 0.255 mg. of calcium arsenate per gm. of leafworm body weight was required for an average lethal dose in comparison with 1.357 mg. for the 5 per cent DDT-pyrophyllite mixture.—M.E.E.

KULASH, W. M. **Benzene hexachloride and chlordane to control cotton boll weevil.** *J. econ. Ent.* **40.** 644-50. [N.C. Agric. Expt. Sta. Raleigh] **855**

Field and laboratory trials were conducted, using different concentrations of chlordane and benzene hexachloride. In the field, benzene hexachloride dusts containing 1 and 5 per cent of the gamma isomer were used. The 1 per cent gamma isomer benzene hexachloride dust did not give satisfactory control of the weevils. The effect of the 5 per cent dust was most marked, but the material did not have any great residual power; the value of an insecticide for boll weevil control is considerably enhanced by residual toxicity.

The laboratory tests included benzene hexachloride dusts of 1 to 10 per cent gamma isomer content as well as chlordane sprays and dusts of various concentrations. Two different methods of testing were used. Benzene hexachloride dusts of 1, 2, 5, and 10 per cent gamma isomer content did not show any great difference in the number of weevils killed at 24 to 72 hours, when the weevils were exposed to the dust. When the weevils were allowed to come into contact with the dust, mortality was high up to 8 hours after exposure. Chlordane dust and spray was also used according to the two different methods. The liquid was more toxic than the dust, but did not work as rapidly. Benzene hexachloride dusts 2 and 5 per cent gamma isomer content were more toxic to boll weevils than were chlordane dusts of the same concentrations.—P.M.

MILLIKAN, C. R. **Zinc toxicity in the flax grown in a wire netting "bird cage".** *J. Aust. Inst. agric. Sci.* **13.** 64-7. 1947. [Dept. of Agric., Burnley, Victoria] **856**

Plants of *Linum usitatissimum* grown inside a galvanized wire mesh cage to protect them from birds have shown symptoms of a disease attributed to zinc poisoning. Early symptoms consisted of retarded growth and necrosis of the leaf tips, and the plants later developed a rosetted appearance. The disease was prevented by treating the soil (a sandy loam of pH 6.0) with 1 ton of hydrated lime per acre before sowing. Effects of other treatments suggested that the disease was due to an excess of zinc in the soil, and recovery of the plants was associated with the onset of warmer and drier conditions in the spring. Water culture experiments to determine the symptoms in flax arising from excessive applications of zinc were also conducted and analyses of zinc and iron contents are presented for chlorotic and non-chlorotic flax plants of 6 weeks growth.—M.E.E.

WAGER, V. A. **Wilt disease of New Zealand flax.** *Fmg S. Afr.* **22.** 871-8. 1947. **857**

The results of an enquiry into a fungous disease which ruined a thriving fibre industry in South Africa early in the war. The fibre-plant concerned was *Phormium tenax*. Soil conditions, the appearance of infected plants, cause, inoculation experiments, drainage experiments and other relevant information respecting the history of the disease is given.—G.M.H.

LONDON, Empire Cotton Growing Corporation. **The evolution of Gossypium and the differentiation of the cultivated cottons. Being the final report of the Genetics Department, Cotton Research Station, Trinidad, B.W.I.** By *J. B. Hutchinson, R. A. Silow* and *S. G. Stephens.* 22 × 14. pp. xi + 160. London: Geoffrey Cumberlege, Oxford Univ. Press, Amen House, Warwick Square, E.C.4. 1947. 15s. 0d. **858**

When the Cotton Research Station in Trinidad was opened in 1926, cotton was botanically one of the less known crops. To meet the need for study of the botany and genetics of *Gossypium*, work at the Station developed along three main lines: (1) classification of the genus was reviewed in the light of experience with living material; (2) the differences in gene content responsible for racial, varietal and specific differences among cultivated cottons were studied; and (3) an enquiry was made into the wider relationships of wild and cultivated species. Results have been published in the Memoirs of the Station, and in the present work an account is given of the plant's evolution and present status based on the experimental evidence.

The publication is in four parts which deal with classification of the genus, evolution of *Gossypium* species, differentiation of the true cottons, and the significance of the genus in evolutionary studies. The work brings into focus, from a multitude of known facts about cotton, many problems of plant evolution in general. In regard to cotton it is contended that "future breeding programmes must be designed for the maintenance of variability instead of for the isolation of pure lines." The successful development of such work depends on a background knowledge of population genetics and crop variability. Further research is to be pursued on *Gossypium* in contact with the commercial crop in Africa.—M. Hall.

MILLIKAN, C. R. **Effect of phosphates on the development of zinc deficiency symptoms in flax.** *J. Dept. Agric. Vict.* **45.** 273-8. 1947. **859**

Much evidence is available to show that zinc deficient plants are often associated with soils containing excessive amounts of phosphatic salts. The present pot and field experiments were undertaken with *Linum usitatissimum* plants to obtain further local evidence of the effect of phosphates on the incidence of zinc deficiency. Superphosphate and di-sodium phosphate treatments were used in both types of experiment and the plants developed severe rosetting and "die back". Results showed that where dressings of zinc sulphate at 20 lb. per acre were applied either alone or in combination with superphosphate or di-sodium phosphate, there were significant decreases in the severity of zinc deficiency symptoms. It was concluded that phosphate induces zinc deficiency in flax and that di-sodium phosphate is more dangerous in this respect than superphosphate. Further, the zinc deficiency symptoms were more severe in winter-sown flax than in a similar crop sown early in spring.—M.E.E.

ROBERTY, G. Gossypiorum revisionis tentamen. [**An attempt at revision of the genus Gossypium.**] *Candollea* **10.** 345-98. 1946. **860**

Taxonomy of the genus *Gossypium* is discussed. In this article morphological features which determine subspecies and varieties of *G. peruvianum* and *G. barbadense* of the group *insculpta* are dealt with in great detail.—D.B.

SUGAR BEET

ÅSTRAND, H. Sockerbetsodlingen 1947. [**Sugar beet cultivation 1947.**] *Lantm. Svenskt Land* **32.** 64-5. 1948. **861**

Germination conditions varied considerably. In north-west Scania in particular the soil dried up so rapidly that in many places the seed did not germinate. The mean sowing date was the latest for many years: 8th May.

For the first time sowing of one-germ seed was carried out on a large scale: the area amounted to 3297 ha. or 6.9 per cent of the year's sugar beet area. The rate of seeding of one-germ seed was 10.8 kg. per ha. compared with 19.6 kg. of ordinary seed. The gain in time spent in singling was estimated to be on the average 20 per cent. The high sugar content, at least in some areas, compensated well for the small crop. Gotland led with 19.61 per cent followed by Östergötland with 19.52 per cent. The average yield for the whole country was only 31.0 tons per ha. The average sugar content was 17.79 per cent.—R.P.J.

SCHOELLER, K. A. Die Zuckerrübe in der deutschen Ernährungs- und Futterwirtschaft. [**Sugar beet as a food and feeding stuff in Germany.**] *Kühn Arch.* **53.** 57-140. 1940. [Received 1947] **862**

An account is given of the production of sugar from 1835 onwards. The account includes cultivation areas, distribution of these areas at different periods (1878, 1914 and 1936) and yields. This is followed by an account of the German sugar industry, of marketing, taxation of sugar, and sugar consumption in various countries. The importance of the sugar beet in animal fodder is discussed. The fresh and dried beet, sugar beet tops (whether fresh or preserved) and biproducts of the sugar industry can all be used for fodder. Nutritive value, methods of feeding, and costs of the various types of fodder from sugar beet are given. The world situation as regards sugar beet production, including its relation to cane sugar production, is discussed.—D.B.

ALPWIRTSCHAFTLICHE MONATSBLAETTER. Warum Zuckerrübenanbau? [**Why sugar beet cultivations?**] *Alpw. MBl.* **82.** 57-60. 1948. **863**

The political aspect of cultivation areas for sugar beet, written for the benefit of mountain farmers in view of the vote on March 14th.—D.B.

ЧЕРНЕНКОВ, А. Д. Свеклосеяние в Литовской ССР. *Сахар. Промышл.* 1947. *No.* 12. стр. 14-7.

Černenkov, A. D. [**Beet sowings in Lithuanian SSR.**] *Sahar. Promyšl.* 1947. No. 12. pp. 14-7. [All-Union Sci. Res. Inst., Sugar Industry] **864**

In the vast territory of USSR, beet sowings are made under the most varied conditions, and measures for successful production should be studied in each locality. The most intensive production is in the black-soil area of the Ukraine (Kursk, Voronež). There is need for more information on (1) cultural measures necessary in unfavourable climates; (2) local varieties suitable for irrigated areas (Central Asia, Georgia, Armenia); and (3) production in the podzol-forest zone (Latvia, Lithuania, Esthonia and White Russia), where cultivation has been started only recently, i.e. during 1930-1 in Lithuania. The sown area in Lithuania has been extended rapidly and in 1947 reached a total of 17,800 ha., but yields have fallen during the war years. Research activities also decreased during the war and have not yet been restored. Tests are being carried out at present in three Lithuanian experiment stations, namely, Ioniškeljsk (heavy soils in the north), Dotnuvsk (clay soils of middle region), and Rumokaĭsk (light clay and sandy soils of the south).

The advantages of early sowing at these stations have been observed; the dates are from 24 April to 4 May in the northern area, from 21 April to 4 May in the middle region, and from 16 April to 4 May in the south. Postponement of sowing date by 20 days results in an average yield decrease of 64 centners per ha.

There is discussion of cultural measures, of the need for improving seed supplies, and for selecting early ripening varieties suitable for the colder regions of the podzol soils.—M.H.

ИМАНГАЗИЕВ, К. И. Способы посева и площади питания сахарной свеклы. *Совет. Агрон.* 1947. *No.* 4. стр. 35-8.

Imangaziev, K. I. [**Methods of sowing and areas of nutrition of sugar beet.**] *Sovet. Agron.* 1947. No. 4. pp. 35-8. **865**

In areas of irrigated agricultural land the existing method of sowing sugar beet is not adapted to the requirements of agricultural technique and in fact hinders the obtaining of high yields. By extending the inter-row width from 50 to 60 cm. the number of roots declines sharply, the quality of the beet is impaired and the sugar content is reduced. The wide-row method of sowing with inter-row spaces of 60 cm. guarantees high yields only on very fertile soils in high cultivation. With customary collective farming technique it gives a depression in yield, as sugar beet does not utilize fully the area allotted to it. In irrigated areas the wide-row method of sowing must be combined with narrow-row sowing. Wide inter-row spaces facilitate to a considerable extent the mechanization of the processes of cultivation, of waterings. Increase of the number of plantings to 90-100 thousand and of the average weight of each root to 500-1000 grm. by means of a variation of the method of sowing provides the highest yield of roots and sugar.

The area of nutrition of sugar beet under the conditions in irrigated areas should be from 800 to 900 sq. cm. for each plant. An increase in the distance between the plants has a more marked effect in raising the yield than the width between the rows.—R.P.J.

ГИРДА, А. Д. Мероприятия по улучшению хранения сахарной свеклы. *Сахар. Промышл.* 1947. *No.* 12. стр. 28-31.

Girda, A. D. [**Measures to improve storage conditions for sugar beet.**] *Sahar. Promyšl.* 1947. No. 12. pp. 28-31. **866**

To protect harvested beets from unfavourable weather conditions, the heaps should be not more than 1.25 to 1.75 m. high and they should be covered at the onset of frost with a layer of earth 50 cm. thick. The method of storage and covering has been studied in relation to the need for ventilation and for preventing sugar loss.—M.H.

Gisiger, L. Die Zuckerrübe und ihre Kultur unter spezieller Berücksichtigung der Düngung. [**Sugar beet and its cultivation under specific manuring conditions.**] *Die Grüne* **75.** 681-97. 1947. [Eidg. Agrikulturchemischen Anstalt, Liebefeld-Bern] **867**

It was 200 years ago (1747) that the presence of sugar was first discovered in the sugar beet and for the past 150 years systematic breeding has been in progress. A short and amply illustrated account is given of breeding, sowing, singling, climatic and soil requirements and disease. As indicated in the title, a more complete account is given of manuring. Yields of beet, sugar and tops are given under various combinations of nitrogen, potassium and phosphate fertilizer.—D.B.

California Agricultural Experiment Station. Bull. 701. **Seed-bed preparation and cultivation for sugar beets.** By *L. D. Doneen.* 1947. pp. 16. **868**

In California there has been a tendency to plough the seed-bed deeply and reduce it to a fine state. Investigations were carried out over a period of four years to determine whether or not this type of seed-bed is necessary for sugar beet. All the land used had been previously cropped and was comparatively free of weed and grass sod or fibrous plant residue. Under these conditions results show that there is no advantage in deep ploughing and that nothing is gained by ploughing providing shallow cultivation kills all weed growth; cultivation is necessary only for weed control.—P.M.

NELSON, R. T. **The ridge-cover method at the Longmont Experiment Station.** *Proc. Amer. Soc. Sug. Beet Tech.* Regional Meeting, Feb. 3 and 4, 1947. 131-3. 1947. **869**

A test was designed to compare standard, furrow, and ridge-cover planting methods. A further test resulted from the spontaneous employment of ridge-covering some weeks after the Station fields had been planted by the usual standard flat method. Ridge-cover was advantageous, under certain conditions, for elimination of weeds, conservation of moisture as well as control of surface soil crust. If conditions were so dry that no moist soil was thrown over the planted rows during ridging, the process was found to be of no aid to germination. Under such conditions, ridging was effective when delayed until immediately following a light rain; if then the precipitation was heavy, or if soil moisture was abundant, ridging provided no beneficial effects for germination. No essential differences were observed in the comparison of furrow and standard flat planting.—P.M.

HAMMING, G. Grafische verwerking van een Fisher-proef. [**Graphic treatment of a Fisher trial.**] *Landbouwk. Tijdschr.* **59.** 496-504. [English summary, p. 504.] 1947. [Inst. v. Rassenonderzoek v. Landbouwgewassen, Wageningen] **870**

Graphical fertility correction, applied to a Rothamsted experiment on sugar beet (Wishart, *Wiss. Arch. Landw.* A.5, 561-84, 1930-31; and Yates, *J. agric. Sci.* 23. 108-45. 1933). The author believes that fertility is but little correlated with rows and columns. He therefore corrected for fertility non-orthogonally. In this manner the analysis of variance of objects remained orthogonal. The error variance has been reduced to about 16.41, being about one-third of the value given by Yates (45.85).—From Author's summary.

FARM MECHANIZATION. **International Beet Harvester.** *Fm Mech.* **2.** 75. **871**

Mechanical details of an American harvester designed for use with beet planted in 20-22 in. rows. The topping, digging, cleaning and primary elevating mechanisms of the International HM-1 sugar beet harvesters are mounted on the tractor (Farmall Model H, M or MD).—G.M.H.

CULPIN, S. **Row-crop cultivation of sugar beet.** *Fm Mech.* **2.** 46-8. 1948. [Norfolk Agric. Sta.] **872**

The first of two articles on sugar beet cultivation dealing respectively with (1) hoeing between the rows to destroy weeds, and (2) mechanical bunching as a means towards quicker singling. Certain underlying principles of crop husbandry are examined and the advantages of mechanical methods in inter-row cultivations noted. There are three essentially different groups of mechanized hoeing equipment: the toolbar hauled by a two-wheeled market garden tractor; the self-propelled chassis, carrying a hoeing frame, and the toolbar attached to a farm tractor. Certain details of design and illustrations are given. In practice there seems to be a need for only three types of side-hoes, which together with various sizes of A hoes should be capable of dealing with any conditions.—G.M.H.

YONT, L. Y. **Progress in beet crop mechanization.** *Sugar* **42.** 26-7. 1947. **873**

The acreage of beet mechanically harvested in U.S.A. in 1946 was almost double that of 1945, and it is estimated that the 1946 figure was again doubled in 1947. Some of the new harvesters are briefly described and illustrated in this article. The new model of the Sterling Machine Company's Harvall has shown itself well designed to operate under severe and muddy soil conditions. The most striking feature of this machine is the six-foot diameter rings, or rims with protruding four-inch spikes which impale the sugar beets and make it possible for the machine to operate without 'bogging down' in unfavourable soil conditions. A rotating gear device located between the rims elevates the beets. The International Harvester Company produced a one-row topper of the disk type, possessing a trailer which has a load capacity of about 1.5 tons of beets. Running horizontally along the top of the trailer is an accessory clod-sorting belt which permits the sorting out of clods and the trimming of beets. A two-row complete harvester was produced by the Julius Sishc Company. It is powered with a 55 h.p. Buick truck engine and provides the possibility of windrowing both the tops and the roots of 12 rows of beets simultaneously and elevating either the tops or the roots, or both into separate vehicles. The Kiest-Bell Topper's new feature is that after the four rows of beets are topped, the petioles that might still be adhering to the crown, are brushed off with a rotary device which is attached to the top of the beet topper conveyor.—P.M.

TINGLEY, R. J. **A new decorticating machine for sugar beet seed.** *Proc. Amer. Soc. Sug. Beet Technol.* Regional Meeting, Feb. 3 and 4, 1947. 180-2. 1947. **874**

The machine is the result of the work done by Professor Roy Bainer of the University of California, in co-operation with the Holly Sugar Corporation. Two vertical shafts, mounted in a rigid angle-iron framework, are driven by V-belts from a 5 h.p. motor developing 1150 r.p.m. A 10-inch diameter grinding wheel is mounted on the upper end of one of the shafts, and rotates at 750 r.p.m. Mounted above this wheel, on an adjustable mounting plate, is a steel burr plate. Seed is introduced through a funnel in the upper plate and collected through another funnel around the grinding wheel; it is fed by gravity into a similar hopper through the centre of a rubber-faced plate and a 20-in. grinding wheel, which rotates at 435 r.p.m. Discharged from this wheel, the seed is delivered directly to an air-lift elevator and a system of Clipper cleaners to screen and fan the processed seed to the required standards. Afterwards the seed is run over a gravity table cleaner and separated according to specification. The rubber plate and burr plate are set with clearances of 0.150 and 0.125 in. from the grinding wheels, the setting being dependant on the size of the seed introduced and the size of the finished product. Capacity varied between 400 lb. and 800 lb. per hour of whole seed, dependant upon size and condition of seeds and the setting of the plates.—P.M.

PRICE JONES, D., and JONES, F. G. W. **Wireworms and the sugar-beet crop: field trials and observations.** *Ann. appl. Biol.* **34.** 562-74. 1947. [Sch. Agric., Cambridge] **875**

Observations on wireworms in the sugar beet crop during 1937-40 indicated the importance of alternative food, such as buried turf, weeds, excess seedlings and interdrilled wheat in determining the degree of injury to the crop.

In 1938, out of 36 recorded fields growing sugar beet after ploughed-up grass only one suffered severe wireworm damage. Six of these fields were selected for resowing with sugar beet in 1939, and all suffered moderate or severe attacks. Several other fields in their first year from grass showed only slight damage. These observations were supported by an analysis of the Norfolk War Agricultural Committee crop records for 1940.—From Authors' summary.

DOXTATOR, C. W., and DOWNIEL, A. R. **Breeding for resistance to** ***Aphanomyces*** **root crop.** *Proc. Amer. Soc. Sug. Beet Technol.* Regional Meeting, Feb. 3 and 4, 1947. 134-8. 1947. **876**

In 1942 the Crystal Sugar Company began breeding tests for resistance to root rot of sugar beets caused by *Aphanomyces Cochlioides* (Drechs). A selection of beets made in 1944, when severe disease conditions prevailed in the variety American No. 1 (1941 Com'l), showed better resistance as compared with check varieties in tests in a severe epidemic in 1943. From the root selection made in 1945 individual open-pollinated seed progenies were tested in 5 locations in southern Minnesota in 1946. In the test where the most severe attack of root rot occurred, 20, of the 71 lines tested were judged to be superior in resistance to any of the checks. Average yield of perfectly shaped beets, free of disease, of the 20 selected items was 0.394 lb. per foot of beet row. The yield of the American No. 3 Com'l check was only 0.11 lb. Mild to medium root rot conditions prevailed in this field and marked improvement in resistance to the disease was shown in 20 out of the 71 plant lines tested. Further details of tests will be published shortly.—P.M.

DOYLE, R. J. **Controlling sugar beet blackroot.** *Sugar* **42.** 36-7. 1947. **877**

In 1945 experiments were started to find some means of eliminating blackroot damage. Seed treated with the fungicide "Arasan," containing tetramethyl-thiuramdisulphide, failed to produce a blackroot-free plant. Later, the soil was treated with "Arasan" and effective control of blackroot was obtained. The control process was developed by co-operation between officials of the Plant Pathological Laboratory, Ontario, research experts of the Canada and Dominion Sugar Company and the Technical Service Division of Canadian Industries. An application of 3 lb. per acre of "Arasan" largely eliminated blackroot, the cost being only 3.50 dollars per acre.

The disease is caused by a group of fungi which attack the lower stems of seedlings and it thrives under warm, humid conditions and in areas of intense beet cultivation. In another series of experiments "water mould," the most elusive of the fungi, was isolated, and "Arasan" effectively controlled it. Stands of beet were 3.5 times better on treated than on non-treated soils. The treatment is already used by hundreds of farmers in south-west Ontario and by the spring of 1948 it is estimated that every grower in blackroot areas of the province will be using it.—P.M.

SWIFT, E. L., and CLELAND, F. A. **Progress report. The effect of climate on sugar beet yields in Western Montana.** *Proc. Amer. Soc. Sug. Beet Technol.* Regional Meeting, Feb. 3 and 4, 1947. 128-30. 1947. **878**

A study of yields and annual mean temperatures have shown a marked correlation, and it was found possible to predict the beet yield by a comparison of previous data of mean temperatures and yields. In 1946 predictions of yields were made from mean temperatures for six, nine and twelve months, accuracy of prediction increasing with the longer temperature recording. In general "high mean temperatures . . . . are reflected in lower sucrose content, and lower mean temperatures indicate a higher sugar content."—P.M.

ROOT CROPS

HEYL, W. Der Einfluss der Bodenstrukturerkrankungen auf die Wurzelentwicklung landwirtschaftlicher Kulturpflanzen. [**The influence of defects in soil structure on root development in farm crop plants.**] *Kühn-Arch.* **56.** 215-45. 1942. [Received 1947] **879**

The influence of method of tilling the ground on morphological structure of roots is described. Loosening of the subsoil results in a more abundant and healthy root growth and greater ability to make use of the available nutrients. Results are described for potato, mangold, sugar beet, and winter wheat. Higher yields have been obtained by using a plough without a sole or any other device which results in compression of the soil.—D.B.

WILLIAMS, E. G., and REITH, J. W. S. **The relative effectiveness of phosphatic fertilizers.** *Emp. J. exp. Agric.* **16.** 1-13. 1948. **880**

Field and pot experiments on acid soils of different geological origins to investigate the relative effectiveness of a series of phosphatic fertilizers. Crops used were either potatoes, turnips or swedes. No marked or consistent difference was found in the effectiveness of phosphates other than mineral phosphates, calcium metaphosphate, and Sensol. The metaphosphate and Sensol gave results similar to those of mineral phosphates which were frequently effective on turnips and swedes, but not on potatoes.—G.M.H.

WHITE, J. H. **Preliminary experiments on the control of mangold fly.** *Brit. Sug. Beet Rev.* **16.** 67-9. 1947. **881**

In the experiments, 2.5 per cent benzene hexachloride at the rate of 56 lb. per acre gave good control over the first generation. An application of 1 cwt. per acre of 4 per cent B.H.C. was necessary against the second generation. Correct timing of application is emphasised—that is, " as soon as the eggs have hatched and the small mines are noted in the leaves."—P.M.

STAHL, C. Forsyningen med Roefrø. [**The supply of seed of root crops.**] *Ugeskr. Landmn.* **92.** 815. 1947. **882**

Rationing of swede seed was introduced on 22 November, 1947. Owing to the severe winter last year practically all the cultivations of swede seed were destroyed. Large stocks from previous years are available so that farmers can purchase approximately one-half the amount of seed sown in 1947. As swede seed when stored dry retains its power of germination for two or three years, stocks held by individual farmers can be sown with good results. For seed production of beets, and especially of fodder-beets, roots are planted out in the spring : a count made recently shows that this year's crop of fodder-beet seed and fodder sugar beet seed together with the available stocks will be more than sufficient for sowing the usual areas with these beets in the spring of 1948. Seed of sugar beets for fodder is in very short supply, but other fodder-beets (of which as stated above there is an ample supply of seed) can be used as a substitute. A considerable store of sugar beets for industry is available, so that there will be sufficient seed for sowing the usual area.

There is sufficient turnip seed and carrot seed for normal consumption.—R.P.J.

WILLEMSEN, W. De teelt van knolzaad bij uitzaai in het voorjaar. [**Production of turnip seed by sowing in spring.**] *Maandbl. LandbVoorlDnst* **5.** 24-30. 1948. [Chief Assistant for Pastures and Forage Crop Production, Arnhem] **883**

The best and safest way of obtaining turnip seed (*Brassica rapa*) is by planting out root slips in the autumn. It can also be grown from seed sown in February or the beginning of March. The yield of seed grown this way is generally rather lower and the seed is rather finer. Another possibility is the forcing of plants under glass or in boxes under cover, but the plants must be hardened off before transplanting. A good, moist soil is necessary and the plants must be well pressed down.—G.M.R.

CROP PHYSIOLOGY

WASHINGTON, American Potash Institute, Inc. **Boron as a plant nutrient. A bibliography of literature published and reviewed, January, 1941, through December, 1941 (with Index).** By *Catherine M. Schmidt, Doroth H. Jameson, Helen N. Hudgins* and *Virginia G. Specht.* 1947. pp. 78. [mimeographed] **884**

LANG, A. Entwicklungsphysiologie. [**The physiology of development.**] *Fortschr. Bot.* **11.** 268-317. 1944. [Berlin-Dahlem] **885**

In the first section on the physiological aspect of development examples are given of the periods of rest and activity in plants before maturity is reached ; growth, division, size and the effect of growth substances ; differentiation ; rejuvenation (reversal of differentiation back to a certain stage) ageing and death. There follows a recent literature review for the years 1939 to 1942 of the effect of external factors such as temperature, light and photoperiod ; the course of vegetative and sexual development in flowering plants from the embryo onwards; and the physiology of reproduction and sex is illustrated by algae and other lower plants and by flowering plants.—D.B.

NARANJO, V. P. Las heladas y la necrosis fría de las plantas. [**Frosts and cold necrosis of plants.**] Univ. Press, Quito, Ecuador. 1947. pp. 125. pls. 3 charts. [English summary, pp. 117-9.] **886**

Only the Andean regions of Ecuador, from 2000 to 2500 m. and upwards, are affected by frosts. Frosts in this country are generally considered to be due to a loss of heat by irradiation from the ground surface taking place during cloudless nights. Although it is certain that frosts are more frequent in the dry months, which are different in the various natural regions of the Andes, statistics show that they may occur at any time of the year. Some frosts, and particularly "black" frosts, traumatize the tender shoots of numerous species of wild and cultivated plants in such a way as to cause the death of the plants, a phenomenon referred to here as "cold necrosis of plants". The author has tested the commonly accepted theory which states that when the temperature falls to 0°C. or still lower, the cellular juices and sap contained in the vessels of the plant suddenly congeal, which so increases their volume that the vessels and cells explode and become necrotic, a process subsequently aggravated by the violent action of the sun's rays. The author's preliminary studies of frost-killed tissues showed the cellular and vascular membranes to have remained intact and uninjured, however, and it was later proved that in the frosted tissues the cellular protoplasms were coagulated. The protoplasmic coagulation is considered to be due to a process of cellular acidosis, brought about by a break in the chemical chain of cellular respiration. The author's results agree with Soviet investigations into the biochemical phenomena of vernalization, in so far as the variations of the cellular pH due to the influence of cold are concerned. Frost-killing is not a violent, instantaneous phenomenon like that of the congealing of water; on the contrary, the process is slow, requiring several hours of temperatures close to or below 0°C., and generally, if the frost is not very severe, necrosis occurs only on the second or third day of consecutive frosts.

Frosts can be foretold and it is possible to control their effects. Measures suggested are: (1) Formation, from the first hours of dawn, of dense clouds of smoke over the area concerned, an operation which should be technically directed and State-controlled. (2) Plentiful irrigation of cultures the evening before and at the very moment when frost occurs, with the object of preventing the great irradiation of heat and then of controlling subsequent physiological effects. (3) Creation of an Institute of Genetics for the purpose of producing frost-resistant varieties of plants.—From Author's summary.

STOMPS, T. J. Kleistogamic als mendelndes Merkmal. [**Cleistogamy as a mendelizing character.**] *Rec. Trav. bot. néerland.* 41. 118-30. 1946-48. [See *Plant Breeding Abstracts*] **887**

КОЧЕРИНА, Е. И. К вопросу о влажности завядания растений. *Почвоведение.* 1948. *No.* 1. стр. 49-61.

KOČERINA, E. I. [**Moisture of wilting in plants.**] *Počvovedenie* 1948. No. 1. pp. 49-61. Soil Inst., Acad. Sci. USSR.] **888**

In general studies on soil moisture, the question of the minimal amount of soil moisture which is necessary for the life of the plant has received much attention. In defining this minimal amount, different terms have been used such as "moisture of wilting", "coefficient of wilting", "critical moisture content", etc. The first of these is accepted in this paper as being most correct.

There are two theories regarding the relationship between moisture of wilting and plant species. One postulation is that no connexion exists between the two factors because while the difference in osmotic pressure in the cell sap in different plants fluctuates within narrow limits (1.5 to 30 atm.), the absolute amount in plants is negligible in comparison with that in the soil where the water is under a pressure of 100 to 1000 atm. With such high pressure in the soil, the variation in suction force of roots of different plant species is of no significance in relation to moisture of wilting. This viewpoint is supported by much experimental evidence, but there is less support for the second theory in which it is maintained that the relationship is of significance.

The various methods used for determining the moisture of wilting are reviewed, and in the author's present study of moisture of wilting in different soil types, the method involving culture experiments with wheat seedlings is employed.—M.H.

LEWICKI, S. Studia nad jarowizacją roślin. [**Studies on vernalization of plants.**] *Mém. Inst. polon. Écon. rur.* **17.** 1-132. [English summary, pp. 113-32.] 1939. **889**

The work was presented for publication in March 1937, and therefore is not concerned with the literature on the subject after that date. The experiments were made with rye, wheat, and species of *Brassica*. There is also discussion of the possibilities of applying vernalization and its relation to methods of plant breeding.—M.H.

Mathur, P. B. **Chemical composition of storage organs of plants—a factor in photoperiodism.** *Curr. Sci.* **16.** 338-9. 1947. [Coll. Agric., Benares Hindu Univ.] **890**

Experiments with *Beta vulgaris* and *Secale cereale* have shown that plants in which starch is the main storage material continue to flower at a higher temperature than those in which sugar is mainly stored. Details of the tests are to be published elsewhere.—M.H.

Padmasini, K. **Antiseptic culture of ragi** (*Eleusine coracana*) **seedlings and their response to vitamins.** *Curr. Sci.* **16.** 227-8. 1947. [Sect. Ferment. Tech., Indian Inst. Sci., Bangalore] **891**

The excised roots of the seedlings grow well in a basal medium of sucrose and inorganic salts. Because they synthesize their own vitamins they do not require an external supply of any of the vitamins tested; this also explains why ragi can flourish on soils where many other plants cannot thrive.—M.H.

ENVIRONMENTAL STUDIES

Dobben, W. H. van. Phaenologische waarnemingen aan een zaaitijdenproef met granen. [**Phenological observations on cereals sown at several dates**]. *Landbouwk. Tijdschr.* **59.** 485-95. [English summary, pp. 494-5.] 1947. [Cent. Inst. Landbouwk. Onderzoek, Wageningen, Netherlands] **892**

(1) *The date of ear emergence.* Several varieties of wheat, barley and rye were sown periodically from September 25, 1942, to May 15, 1943. The corresponding dates of heading are recorded. In general, later sowing causes later heading, whereas rye heads before barley and barley before wheat. Wheat appears to be divided into early and late types, the late types requiring, perhaps, higher spring temperatures for ear emergence than early types. Apart from temperature in spring, ear emergence depends on (a) the stage of vegetative development, (b) the degree of vernalization, which, if inadequate, delays ear emergence. The effect of these two factors is discussed in considerable detail in the English summary. (2) *The period from sowing till ear emergence.* This is recorded for several sowing dates. In general it is shortened by later sowing, except when this implies lack of vernalization. The shortest period recorded is 40 days (late spring sowing of Petkus rye). (3) *Thousand grain weight.* Delay in ear emergence is accompanied by low yield, mainly caused by low thousand grain weight. Late heading seems always to reduce thousand grain weight at the same rate. (4) *The period from ear emergence to ripening.* This is very long in rye, very short in barley. It is much less influenced by the sowing date than the preceding period, although late sowing gives a slightly shorter ripening period.—From Author's summary.

Japha, Brigitte. Studien über Frühjahrsschäden an Winterweizen. [**Spring damage in winter wheat.**] *Kühn-Arch.* **60.** 429-39. 1943/44. [Halle] [Received 1947] **893**

Observations on spring damage in winter wheat in East Prussia and the reactions of different varieties are recorded. Observations on roots are reported and the literature on the subject is reviewed. It is thought that a series of interacting physiological factors is responsible. The part played by each factor is to be investigated. —D.B.

Ciferri, R. Osservazioni ecologiche-agrarie e sistematiche su piante coltivate in Etiopia (Guizotia, Linum, Avena, Sorghum, Eragrostis, Eleusine, Pennisetum, Hordeum, Triticum). [**Ecological-agrarian and systematic observations on plants cultivated in Ethiopia.**] *Atti Ist. Bot. Univ. Pavia* Ser. 5. Vol. II (2), 123-232. 1944. **894**

The author carried out a study on original plant material cultivated in Ethiopa, Eritrea, and Somaliland; ecological, botanical-agrarian and mainly systematic data are supplied with reference to studies and classifications previously made by other research workers.

The problem of the mountainous part of Abyssinia as an evolution centre of cultivated species is considered, and particularly the relation of this centre with that of south-east Asia, which is the most important of all. For every plant under consideration the author tries to determine its centre of origin and the geographical area of diffusion. For some of these plants, such as "teff" (*Eragrostis tef*) and "neuch" (*Guizotia*), the mountainous part of Abyssinia is a primary autochthon centre, where the diffusion of these plants is limited. Barley (*Hordeum*) has two centres of origin; Abyssinia is one, and in this zone more than half the barley varieties known throughout the world have been encountered. The plants are considered in their spontaneous and cultivated forms, and a systematic classification is given as far as the data in the author's possession permit. As for *Guizotia*, *Sorghum*, barley, and wheat, the division in ecotypes (proles) is given whenever possible; the ecotypes are generally distributed on strips determined by difference in altitude.—E.B.

Miles, J. F. **The pastoral and agricultural growing season in North-eastern Australia.** *J. Aust. Inst. agric. Sci.* **13.** 41-9. 1947. [Div. Plant Industry, C.S.I.R., Canberra, A.C.T.] **895**

An account is given of the climatological features of Queensland and there is a discussion on the zones of seasonal length which have been established. Data from 34 localities, distributed throughout the State, have been employed in calculating the lengths of these pastoral and agricultural growing seasons. The seasonal distribution of wet months in each zone is discussed. The wheat areas are roughly limited by a mean "wet month" expectancy at the 60 per cent level for the May to July period. Most of the maize crop is produced in the zone with a seasonal length of 4.5 months or more, while sugar cane is grown in northern Queensland where the season is of 6 months or longer duration. Plant introductions are recommended for several areas, including grain sorghums and summer growing legumes.—M.E.E.

THORNTHWAITE, C. W. **An approach toward a rational classification of climate.** *Geogr. Rev.* **38.** 55-94. 1948. **896**

A new classification, in which climates are defined rationally and boundaries determined by data in contrast to the author's former classification in which climatic types were identified and boundaries located, empirically, through a distribution of vegetation, soils, drainage features, etc. Vegetation is regarded as a physical mechanism by means of which water is transported from the soil to the atmosphere; it is the machinery of evaporation as the cloud is the machinery of precipitation. Climatic boundaries are determined rationally by comparing precipitation and evapotranspiration.

"Evapotranspiration," the combined evaporation from the soil surface and transpiration from plants, is considered equally important as a climatic factor as precipitation, but as yet no instrument has been perfected to measure this water movement from the earth to the atmosphere. Equally important as a climatic factor is potential evapotranspiration. By comparing it with precipitation a rational definition of the moisture factor is obtained.

Evapotranspiration, like precipitation, is a physical process, but being subject to biological control requires study by methods unfamiliar to the meteorologist. This helps explain the neglect of this climatic factor by the meteorologist in classification studies. A formula is given that permits the computation of potential evapotranspiration of a place if its latitude is known and if temperature records are available.

Reviewing the essentials of a climatic classification the author maintains that it is potential evapotranspiration that must be compared with precipitation to obtain a moisture index rather than actual evaporation and transpiration. Where precipitation is exactly the same as potential evapotranspiration all the time and water is available just as needed, there is neither water deficiency nor water excess and the climate is neither moist nor dry. As water deficiency becomes larger with respect to potential evapotranspiration, the climate becomes arid; as water surplus becomes larger, the climate becomes more humid.

Four symbols used together give a complete description of a climate; they relate to the moisture index, the index of thermal efficiency, the seasonal variation of effective moisture and the summer concentration of thermal efficiency. Figures to illustrate the text include maps showing average annual potential evapotranspiration, average annual water deficiency, average annual water surplus, moisture regions, average annual thermal efficiency, seasonal variation of effective moisture and summer concentration of thermal efficiency—all of which relate to the U.S.A. An appendix gives a method of determining potential evapotranspiration.—G.M.H.

WASHINGTON, AMERICAN INSTITUTE OF CROP ECOLOGY. Int. Agro-Climatol. Ser. Study No. 1. **Ecological crop geography of the Ukraine and the Ukrainian agro-climatic analogues in North America.** By *M. Y. Nuttonson.* 1947. pp. 24. **897**

This is the first of a number of studies dealing with North American agro-climatic analogues for various countries of the world. The general geography of the Ukraine is followed by a discussion of the temperate zone continental type of climate experienced and its North American analogues. The Ukrainian climatic analogues are found in the north-central, south-western and south-eastern Montana, western South Dakota, and western and eastern Nebraska. A number of Ukrainian stations in the elevated areas of the Carpathian Mountains find their climatic counterpart in eastern lower Michigan and western New York. A complete list of the year round North American analogues of the Ukraine is given in an agro-climatic chart which also includes detailed climatic data for 66 meteorological stations in the country.

The three natural and agricultural belts of the Ukraine are discussed in some detail. The Mixed Forest (Polesie) belt refers to the northernmost, coldest and wettest part, situated north of Kiev and covers about 10 per cent of the area of the country. Agriculturally the belt is mainly an area of animal husbandry, hay crops, and potatoes, under fairly intensive cultivation. The Forest Grassland belt, a transition belt, occupies about 40 per cent of the territory. Agriculturally, it is mainly an area of intensive sugar beet and winter wheat production. The Grassland or Steppe belt includes the semi-arid, arid and almost forestless grasslands of the Ukraine to the south-east of the Forest Steppe. The natural vegetation is divided into *Stipa* dicotyledons steppe and the *Stipa-Festuca* steppe the belt being preponderantly a territory of grain culture with winter wheat grown mostly in the western part and spring wheat in its eastern part. Tables give the major woody plant species and the major herbaceous plant species of the Steppe belt;

the major plant species and their characteristics of the Mixed Forest belt and those of the forest association Forest Grassland belt.—G.M.H.

WASHINGTON, AMERICAN INSTITUTE OF CROP ECOLOGY. Int. Agro-Climatol. Ser. Study No. 2. **Agricultural climatology of Poland and its agro-climatic analogues in North America.** By *M. Y. Nuttonson.* 1947. pp. 12. **898**

Brief statements on the climate and geography of Poland introduce the four different approaches used in formulating the climatic analogues. The first approach substitutes altitude for latitude and analogues are found in the upland valleys and in the plateau regions of Colorado and New Mexico between 4-10,000 ft. in Montana between 4-7,000 ft. and in Michigan at 5-600 ft. The second approach is on the basis of winter crop climatic environment (northern Idaho and British Columbia), the third on the assumption that irrigation is available to overcome summer drought (areas within Idaho and British Columbia), and the fourth on spring crop climatic environment (Minnesota, Montana, Alberta, Manitoba, and Saskatchewan).

The data and charts presented in this study are suggested as being merely pointers in the direction of vast agronomical and ecological possibilities.—G.M.H.

WASHINGTON, AMERICAN INSTITUTE OF CROP ECOLOGY. Int. Agro-Climatol. Ser. Study No. 3. **Agricultural climatology of Czechoslovakia and its agro-climatic analogues in North America.** By *M. Y. Nuttonson.* 1947. pp. 12. **899**

Analogues are found on the basis of climatic conditions prevailing throughout the year, but outside the latitudinal ranges of Czechoslovakia. Altitude is substituted for latitude, the analogues being found in the upland valleys and in the plateaus of Colorado and New Mexico. This substitution may carry with it 'photoperiodic and other implications for some of the plant material, but on the whole the vertical zonation of climate and vegetation appears to be similar to the zonation due to increase in latitude.' Three other approaches to the formulating of analogues are given : (1) those based on the growing period of spring-planted and autumn harvested crops (Minnesota, Wisconsin and Canada) ; (2) those based on the climatic environment of winter crops (Idaho, Washington and Oregon) ; (3) those based on latitude and climatic conditions with the exception of natural precipitation during the summer.

Since moisture is no longer a limiting factor to spring crop production and since all other elements of comparison used in the study point to the Northwest as the best North American counterpart of the year-round climatic conditions in Czechoslovakia, the region is suggested as an additional potential source of spring crop seed for Czechoslovakia. Two charts give detailed climatic data for 67 Czechoslovakian meteorological stations and their North American counterparts.—G.M.H.

WASHINGTON, AMERICAN INSTITUTE OF CROP ECOLOGY. Int. Agro-Climatol. Ser. Study No. 4. **Agricultural climatology of Yugoslavia and its agro-climatic analogues in North America.** By *M. Y. Nuttonson.* 1947. pp. 11. **900**

Meteorological data, in so far as they are available, seem to indicate that Slovenia, northwest Bosnia, and southwest Croatia have a climate such as the eastern part of the United States, namely parts of Pennsylvania, North Carolina, Kentucky and Tennessee. An agro-climatological chart gives data for 41 meteorological stations and their North American analogues.—G.M.H.

WASHINGTON, AMERICAN INSTITUTE OF CROP ECOLOGY. Int. Agro-Climatol. Ser. Study No. 5. **Ecological crop geography of Greece and its agro-climatic analogues in North America.** By *M. Y. Nuttonson.* 1947. pp. 17. **901**

A general and comparative geography of Greece is followed by an account of its climate. In most of the agricultural regions of the United States the seasonal variation in rainfall is just the reverse of that of Greece, the only region of similar climatic conditions—dry, clear summers and wet winters—being the Pacific West Coast and more particularly California. An agro-climatological chart gives climatic data for 34 meteorological stations on the Greek islands and mainland, and their North American climatic analogues.

A comparative plant crop ecology of various areas of the country gives cereals as occupying nearly two-thirds of the total cultivated land area. Wheat leads, with barley, maize, oats, rye and rice making up the balance of local grain crops. Tobacco and cotton are the major industrial crops, other industrial crops being sesame, sunflower, groundnuts, castor bean, hemp, and flax.—G.M.H.

WASHINGTON, AMERICAN INSTITUTE OF CROP ECOLOGY. Int. Agro-Climatol. Ser. Study No. 6. **Ecological plant geography of Albania—its agricultural crops and some North American climatic analogues.** By *M. Y. Nuttonson.* 1947. pp. 16. **902**

A general and comparative geography of Albania is followed by a very general statement on its climate. Detailed meteorological data of adequate duration for the whole country is nonexistent and it has been possible to formulate American analogues for only a few stations in the coastal plain. What fragmentary meteorological data that exists for the interior of Albania as well as a survey of its vegetation and plant crop distribution strongly suggest a climate depending rather on altitude than on latitude. An agroclimatological chart of Albania gives details of temperature, precipitation etc. for 8 meteorological stations and their North American analogues.

The natural vegetation, crop geography and agricultural practice of Albania are given. The total acreage devoted to field crops, vineyards, olive groves, orchards and gardens is believed to be about one-tenth of the land area of the country. More than one-half of this area is in field crops, of which the most important are the cereals. The latter are estimated to occupy nearly two-thirds of the total cultivated land.—G.M.H.

WASHINGTON, AMERICAN INSTITUTE OF CROP ECOLOGY. Int. Agro-Climatol. Ser. Study No. 7. **Ecological crop geography in China and its agro-climatic analogues in North America.** By *M. Y. Nuttonson.* 1947. pp. 28. **903**

The precipitation-distribution pattern of China resembles mostly that of the Middle West and its southern extension and the Prairie Provinces of Canada. The predominantly summer maximum type of precipitation of the whole of China is also characteristic of the two regions. An agroclimatic chart gives meteorological information for 120 Chinese stations and their climatic parallels in North America and a separate table gives North American states and provinces embracing areas climatically similar to the various regions of China.

A general and comparative statement on the geography of China is followed by notes on the various major natural divisions of the country. In the section on field practices and agricultural crops it is pointed out that less than one-fifth of the total land area of China is under cultivation, that two-thirds of the entire population is engaged in agriculture and that the average farm unit consists of less than five acres of land. In the production of rice, soybeans, millet, wheat, tobacco and cotton, China holds its own among the largest producers in the world.—G.M.H.

BOOKS AND PERIODICALS

(*For other books reviewed in this issue, see Abstrs.* 683, 691, 813, 829, 858.)

ISSAWI, C. **Egypt: an economic and social analysis.** 22 × 14. pp. xvi + 219. London, Geoffrey Cumberlege: Oxford University Press, Amen House, E.C.4. 1947. 15s. **904**

The author describes the social and economic development of Egypt up to the outbreak of World War II and viewing the process from within he is able to analyse, as few foreigners could, the mutual relations and reactions of its economic and social systems. For the purpose of this review we shall concern ourselves with the chapter dealing with agriculture.

Egyptian agriculture is discussed in terms of its main characteristics, a developed system of irrigation, a backward technique, dependence on cotton, and a very unequal distribution of property accompanied by very small scale tenure and farming. Agricultural technique is still very backward except in its use of fertilizers. The use of imported nitrates and superphosphates, which did not commence until about 1900, but which now averages some 500,000 tons per annum, is essential for supplementing the dearth of natural manure and repairing the progressive exhaustion of the soil. The latter is accentuated by the biennial crop rotation which adopts the cycle: Nov.-May: wheat and berseem (*Trifolium alexandrinum*); June-July: fallow; Aug.-Nov.: maize; Dec.-Jan.: fallow; Feb.-Nov.: cotton. This rotation yields three crops, including cotton, in 2 years, but allows the land only a few months rest. Only a minority of the more progressive landlords observe a triennial rotation under which only one wheat and one cotton crop are grown in 3 years thereby permitting a longer period of rest and summer flooding between the crops.

Cotton constitutes the basis of Egypt's income, the chief varieties grown being Giza 7, Sakel, Maarad, Malaki and Karnak among the long staples (above 1⅜ in.) and Ashmouni and Zagora among the medium staples (1⅜—1⅛ in). Much excellent work in improving existing varieties and propagating new varieties has been done by the Cotton Research Board.

During the last 20 years wheat and maize have shown a marked improvement of yields of 25 and 15 per cent respectively due to the introduction of better varieties and improved techniques generally. Other cereals grown are millet, rice and barley. Berseem (Egyptian clover) the most important of the other crops, forms an indispensable item in any Egyptian crop rotation, restoring as it does the nitrogen removed from the soil by other plants. It yields up to six or eight tons per feddan (1.04 acres) and forms the main green fodder in winter and when dried also provides summer fodder.

The brief account of Egyptian agriculture contained in this book also outlines an agricultural policy aiming at expansion of the cotton crop and the development of fruit and vegetable crops and dairy produce at the expense of wheat, maize and barley. The wastage of time, of seeds, of berseem, as fodder, and of dung (employed as a fuel by the peasants), the illiteracy of the peasants and the absenteeism of many landowners are all given due mention in this very frank analysis of modern Egypt.—G. M. Howe.

Jacks, G. V., and Whyte, R. O. Quando la terra muore. Il problema mondiale dell' erosione del suolo. [**The rape of the earth. A world survey of soil erosion.**] 19 × 13. pp. 240. Milan: Arnoldo Mondadori. 1947. 1200 L. **905**

This work is the Italian version of the authors' publication recorded in *Herb. Abstr.* 9. Abs. 982. In addition to the original text, a chapter has been added by the translator, Dr. Giovanni Friedmann, on erosion in the mountains of Italy (pp. 377-99) and there are some additional illustrations on erosion and soil conservation measures in Italy.—M. Hall.

Harding, T. S. **Two blades of grass. A history of scientific development in the U.S. Department of Agriculture.** 22 × 14. pp. 367. Norman: University of Oklahoma Press. 1947. $3.50. **906**

" It should be the aim of every young farmer to do not only as well as his father, but to do his best, ' to make two blades of grass grow where but one grew before.' " Thus wrote Isaac Newton the first U.S. Commissioner for Agriculture, in his first Annual Report in 1863. This achievement has been brought about by scientific research in agriculture, and the fascinating story illustrates that research which has been carried out although but little publicized, has been of immense value to the American public.

The early stages of development of agricultural science are outlined in the first two chapters, from the first agricultural appropriation of $1000 to the Patent Office, to the Act of 1862, which created the first Department of Agriculture. By 1889 the head of the Department was given a seat in the Cabinet and the research programmes appeared to be eminently successful. Even so, the farmers' problems could not be solved by the administration that then existed. The danger of over-production was a threat which could not be ignored and the only remedy offered by the Department was to evolve methods which further increased production. " That is why," says Harding, " the social sciences soon began to infiltrate the Department getting their start in its scientific agencies."

In part II the author reviews the achievements of the Department. The work covers an imposing variety of subjects and includes plant breeding and plant pathology, forestry, animal production, soils, dairying and agricultural engineering, chemistry and entomology.

Part III is devoted to the scientific agencies. The study of weather has been closely associated with agriculture from the early Patent Office days and as early as 1855 the Commissioner's Report had included meteorological data from different parts of the country. In 1891 the Weather Bureau became part of the Department of Agriculture and remained there until 1940, when it became incorporated in the Department of Commerce. The works of this Bureau, the Public Roads Administration, Fish and Wild Life Service, and Food and Drug Administration, all of which were administered until recently by the Department of Agriculture, are all reviewed.

In part IV—" The Value of Pure Research "—examples are quoted of the value of pure, as opposed to applied research. The financial value of the Department's research work is emphasized by several well-chosen examples. In the case of the Bureau of Plant Industry, Soils and Agricultural Engineering, it has been estimated that "twenty-two of its research accomplishments bring the American public about a quarter of a billion dollars added income annually. If only 5 per cent of its research projects work out practically, and that is a conservative estimate, this will pay $100 for every dollar expended on research by the Bureau."

The book is an interesting account of the development of scientific agriculture in the United States. Its pages are filled with the names of Americans famous in the agricultural world, as well as the names of the lesser known figures of the laboratories and experimental fields whose diligence and hard work have resulted in such an advanced stage of agriculture.—P. Mackintosh.

Wilson, C. M. [Editor.] **New crops for the new world.** 24 × 16. pp. 303. New York: The Macmillan Co. 1945. 17s. 6d. **907**

This volume contains sixteen fully illustrated chapters, each written by a distinguished authority, dealing with important world crops. Probably those of greatest interest to readers of Field Crop Abstracts are those under the heading " Maize in the New World," and " Drugs and Medicinal Plants."

The difficulties of recording and collecting facts about maize, which, as a world crop, is " a phenomenon so enormous that it is almost impossible to see it in perspective " are fully discussed in an illuminating chapter by E. Anderson. Among other things he points out the importance of popcorns and dent corns in distinguishing fundamental differences between different races of maize and how maize breeding gave a hybrid corn which, once its advantages for modern mechanized farming had been demonstrated, completely superseded the whole pattern of maize improvement in the Corn Belt of U.S.A.

A few of the more important drug plants, their culture and a thumbnail sketch of their main pecularities are described by E. C. Hughes and A. Lee followed by notes on the soil and climatic requirements and harvesting methods of *Pyrethrum*, *Lonchocarpus*, *Derris* and other insecticidal plants.

The book is beautifully illustrated by well chosen photographs and the editor is to be congratulated on having obtained the services of a group of such well qualified contributors.—G. M. Howe.

GUTIERREZ, J. P. Bolivia y el mundo. Geografía económica. Tomo II. Agricultura y ganadería. [**Bolivia and the world. Economic geography. Vol. 2. Crop and animal husbandry.**] 24 × 17. pp. 378. La Paz, Bolivia: [published by the author, who is Director General of the Statistics Service of Bolivia and Professor in the Universidad Mayor de San Andrés, La Paz]. 1947. **908**

The first volume of this geography, dealing with the races of Bolivia, population, climate, topography, and transport, has already appeared; the third and fourth volumes, treating the natural resources (other than agricultural), industry and international commerce of Bolivia, are in the press.

The information presented in this volume is mainly statistical, comparison being made of the production of different agricultural commodities in Bolivia and in the other parts of the world. In the first chapter, which outlines the history of agriculture in Bolivia, its deterioration under the early colonists' thirst for the country's valuable ores, and present trends, the author affirms that a transformation of the national economy from mining to agriculture is a matter of life and death for Bolivia. From 1935 to 1945 the population increased by 19 per cent, but the importing of food increased by 175 per cent within the same period. Factors militating against agricultural success are the inadequate population of the country, especially in the hot zone (the average for the whole country is 3 persons pr sq. km.); lack of roads, lack of irrigation facilities, especially in the high inter-Andean plains; faulty technique and insufficient machinery. Fortunately, however, there are signs on the part of both Government and people of an increasing desire to change this, expressed in measures such as the creation of farm schools and of meteorological stations, the instalment of irrigation works in the inter-Andean plains, in the valleys and the south-east, and finally, the importing of agricultural machinery, which reached a peak in 1945. Stations for taking meteorological records have been set up by the Ministry of Agriculture in 150 places, and although they have not been functioning for long, they already render valuable service to the farming community.

The following notes on individual crops, produced almost entirely in the temperate zone, may be of interest.

Wheat. Approximately 33,000 tons are grown annually, but this only covers 34 per cent of the country's requirements, the rest having to be imported. From 1930 onwards efforts have been made to increase production, without much success. Wheat is grown in the temperate zone, but experimental cultures under irrigation in the Altiplano, or high, inter-Andean plains, gave magnificent yields and indicate this region as a promising one for wheat where irrigation facilities are available.

Oats, rye, barley. Oats (470 tons p.a.) and rye (275 tons p.a.) are grown mainly in the Department of Cochabamba, and are not of much importance, but barley growing is increasing in extent. The average production of barley (1937-1942) is 35,000 tons; a peak was reached in 1941-42 with 62,000 tons. Home requirements are practically covered, only a little malting barley being imported. La Paz (cold and temperate) is the Department mainly concerned with barley growing, but there is room for a great intensification of this culture especially in the Altiplano, where, unlike wheat, it can be successfully grown without irrigation.

Maize has been grown in Bolivia for some 1200 years and is still the most important cereal in that country, with an average annual production of 72,000 tons. This is practically adequate to cover home requirements, but the quality of the Bolivian product is so good that the culture might well be extended with a view to industrial uses. Studies for the purpose of selection and improvement are in progress at the University of Cochabamba.

Rice is the staple article of diet in the east of Bolivia. Home production amounts to 8700 tons p.a. or approximately 50 per cent of requirements, but the tendency is for imports to increase. The Bolivian rice is good in quality, that from Santa Cruz, the chief rice-growing region, being considered superior to Asiatic rice and comparable to that grown in Italy. A study of the present situation by the Bolivian Development Corporation concludes that rice yields might be increased by 54 per cent per ha. and the Bolivian rice area by 40 per cent, whereby home requirements would be entirely covered. Here again, however, the transport and road-building difficulty once more presents an obstacle to complete fulfilment of such a plan. The Corporation is nevertheless continuing its efforts, and it is hoped that the importing of rice will soon cease and that Bolivia may even become an exporter of this commodity.

Oca [*Oxalis tuberosa* ?] is a product of South American origin, possibly originating in the Bolivian tablelands. The starchy tubers are much used, fresh or dried, as food in Bolivia and Perú, but are little known elsewhere. Over 25 varieties are known. The crop is grown at altitudes of 3000 to 4000 m., thus in the cold zone, but as it requires a certain amount of shelter it generally occupies the deep gorges or passes between the Antiplano and the lower, broader valleys. Annual production approximately 9000 tons.

Quinoa (*Chenopodium quinoa* Willd.) is indigenous in the highland plains of Peru and Bolivia, and all attempts to cultivate it elsewhere have failed. It is usually grown at altitudes of 3600 to 4000 m., although it can be grown lower, and it does not require very good soil. It is sown in September and October, preferably when there is snow to moisten the ground, and harvested in March or April. The seed is used boiled like rice or in other ways, the leaves like spinach or for salad. Five varieties of this plant, differentiated by the colour and shape of the seed, are known. All possess a bitter principle, saponin, to a greater or lesser degree, which makes careful washing of the product necessary. Experiments have been made in the addition of quinoa flour to wheaten flour for breadmaking, and it is possible that an addition of 15 per cent quinoa might enhance the nutritive value of bread. The average annual production is only 4600 tons, and it has not yet been possible to comply with requests from the United States for this commodity on a purchase basis.

Mandioc (*Manihot utilissima* Pohl, *M. Aipi* Pohl) is a typical product of eastern Bolivia, where the starchy roots form an important article of diet. The total annual production is 20,000 tons, 15,500 tons being grown in the Department of Santa Cruz. In addition, a certain amount of mandioc flour is imported.

Cañagua. This plant resembles quinoa and is often confused with it. Like quinoa it is grown exclusively in the Altiplano, and it cannot be adapted to other climates. Annual production, 900 tons.

Fibre plants. Cotton has been grown in Bolivia since colonial days. Its present importance lies in its excellent quality and the heavy yields given by its cultures, but it is grown in totally insufficient quantity, and the amount of cotton imported increases. The country has, however, excellent conditions, both soil and climatic, for cotton growing. No other fibre plant is cultivated in Bolivia, although several exist, for instance hemp, banana (leaf), maguey (*Agave* sp.) etc., which might well be used for industrial purposes.

Other crops discussed are potatoes, tea, coffee, cocoa, sugar cane, rubber, tobacco, coca and cinchona.—G. M. Roseveare.

REPORTS

Gisiger, L. Bericht über die Tätigkeit der Eidg. agrikulturchemischen Anstalt Liebefeld-Bern im Jahre 1945. [Report on the activites of the Federal Institute for Agricultural Chemistry Liebefeld-Bern, for the year 1945.] *Landw. Jb. Schweiz.* **60**. 477-99. 1946. **909**

The armistice of May, 1945, brought about great changes in the work of this institution. Examinations and analyses are reported on, for artificial manures, soils and commercial fodders. These last include cereals; pulses; biproducts from fermentation and dehydration and from the processing of sugar, starch and oil; fodders of plant origin such as fodder cellulose; animal and fish residues; and supplementary fodders, such as bone meal, cod liver oil and other fish oils.—D.B.

Uganda Protectorate. Annual Report of the Department of Agriculture for the period 1st July, 1945—31st March, 1946. Entebbe, 1947. pp. 92. **910**

The report on cotton by the Plant Physiologist deals with investigation of the changes which occur in cotton leaf tissue during development and ageing of the plant. Using the leaf-punch method of sampling, if constituents such as dry matter or water were expressed on a sample basis (that is, an area basis) the trends in dry weight and water content were quite different, the dry matter increasing as the plants developed, and the water content remaining relatively constant. It was found that considerable fluctuations occurred in cell volume of the samples from time to time through the season. This at once eliminated the usefulness of following trends in leaf constituents on an area basis. Even so, the main results of the previous season were confirmed; when expressed on a cell volume basis the dry weight increased considerably as the plants developed, whilst the changes in water content were relatively small. In addition the protein nitrogen content of the samples was estimated since it was thought that this might be a logical basis on which to express leaf hydration. The weight of protein nitrogen increased with the age of the plant in a similar way to dry weight, and seemed to have no advantage over the latter in expressing changes in leaf hydration.

There was a close correlation between the cell volumes of samples and their water contents when fully turgid. This leads to the tentative suggestion that the water content of the fully turgid sample is a useful basis on which to express its water content as found on the plant in the field.

It was confirmed that the proportion of water to dry weight was similar for different aged leaves and even buds, found on a plant at a given time, and that this proportion fell in all the age categories investigated as the plants developed. Thus, it seems justifiable to conclude that the dry weight per unit cell volume increased in leaf tissue, including buds, as the plants developed. The inclusion of buds is important from the viewpoint of *Lygus* attack, since this insect only attacks very young developing tissues. It is possible that herein lies a clue to the greater resistance to attack of older, as compared with younger, plants.

The Report of the Senior Chemist includes results of trials to determine the effect on soil fertility of returning to harvested cotton areas the plant residues (whether dug in or burned and ash distributed) and seed meal. The data vary according to type of land in the different localities.

The report also includes accounts by the agricultural officers in the different Provinces of varietal trials with species of *Eleusine*, *Setaria*, *Sorghum*, *Pennisetum* and the legumes *Arachis*, *Glycine*, *Phaseolus* and *Vigna*.—M.H.

ZANZIBAR PROTECTORATE. Annual Report on the Department of Agriculture for the year ended 31st December, 1946. pp. 45. 1947. **911**

The preface to the report summarizes the agritural policy of the Government, which includes the introduction and selection of higher yielding strains of existing crops and the introduction trial and acclimatisation of new food crops, with special reference to those of improved nutritive value. Section I reviews agriculture in the Protectorate, principal crops being cloves, coconuts and mangrove bark, and Section II the work of the Department of Agriculture.—G.M.H.

FARMING IN SOUTH AFRICA. Annual Report of the Department of Agriculture for the year ended 31 August, 1947. *Fmg S. Afr.* **22.** 919-1184. 1947. **912**

The report is divided into three main sections, Report of the Secretary for Agriculture, Reports of the Divisions, and Crops and Markets.

The first section reviews the season's food production against the background of world conditions. Prices as stimuli to increased production, the various instruments of production (fertilizers, agricultural implements and machinery), the shortage of bags and the storing of the maize crop are also discussed. Production, quality of the crop, prices, etc. for maize, kaffir corn, wheat, barley, oats, rye, groundnuts and beans are given in the sub-section dealing with the principal agricultural products.

The second section, containing sixteen reports, includes those of the Research Institute, Pretoria, and the Division of Botany and Plant Pathology. Agronomic research in the former consists in the main of long term field experiments in connection with crop production under dry land conditions and under irrigation. The report of the pathological section of the latter Division reveals that barley is very susceptible to streak diseases in addition to maize and wheat. Oats and rye are more resistant. Of the pasture grasses, teff is very susceptible while babala, red grass and sudan grass are apparently immune. Notes are given on research and experimental work being undertaken in the various agricultural divisions, agricultural research stations and colleges of agriculture.

The third section is a statistical and economic review of South African agriculture prepared by the Division of Economics and Markets.—G.M.H.

UNITED PROVINCES, Boshi Sen, Vivekananda Laboratory, Almora. Scheme of Research in plant physiology and cytology. Progress Report 1944-45. pp. 22. **913**

Vernalisation studies were conducted with many different strains of Indian and foreign wheats, barley, cotton and mustard. Responses of wheat strains to vernalisation were noted in the earlier dates of ear emergence obtained and sixty-four strains were suitable for normal October sowing. Experiments were conducted on the storage and germination of vernalised seeds and cotton seedlings were subjected to differential light treatment. Quality and earliness were greatly improved in soybeans by a photoperiod of 9.5 hr. after emergence of the first leaf for 2 weeks, although yields were less than in the control plants. Light treatment of maize was also tried but no appreciable earliness was observed in this crop.—M.E.E.

PENNSYLVANIA Agricultural Experiment Station. Bull. 488. Science for the farmer. 60th Ann. Rep. State College, 1947. pp. 57. **914**

Tests with small grains have been carried on over a period of 3 years. Of the 13 winter wheats tested the variety Thorne was highest in yielding capacity and desirable agronomic characteristics. The highest yielding of six winter barleys was Wong, while Clinton was the best of nine oat varieties. Clinton oats has proved resistant to *Helminthosporium Victoriae*.

Good seed varieties of soybean produced higher yields of hay than Wilson, which is commonly grown for hay. Gibson, Viking, Patoka, Chief and Pennsoy, all outyielded Wilson in this respect. When soybean was grown for seed, Viking and Lincoln yielded over 40 bushels. The former is late maturing, requiring 144 days ; the latter matures in 130 days.

In experiments on soil fertility, liming increased the average value of crops harvested from the Jordan Soil Fertility Plots, $44.55 per rotation of 4 acres. Since 1881 the rotation on these plots has been corn, oats, wheat, and mixed hay. Where clover sod was turned under and was followed by corn, the corn yielded 67.4 bushels per acre, as compared to 38.9 bushels from corn grain after timothy sod.—P.M.

NEWS ITEMS AND SCIENTIFIC NOTES

Sweden

Agricultural Statistics 915

An inventory carried out in 20 provinces shows that 366,800 ha. were sown with autumn grain in 1947 compared with 375,200 ha. in the autumn of 1945, a reduction of only 8400 ha. or 2 per cent. The autumn wheat area has decreased by 15,900 ha. or 7 per cent, and the autumn rye area has increased by 7500 ha. or 5 per cent. Compared with the area sown in 1946, there is an increase in 1947 of 60,000 ha. There has been a considerable expansion in the area sown with oil plants in 1947. The cultivation of autumn rape has increased by 6200 ha. or 65 per cent compared with the autumn of 1946, and now comprises 15,800 ha. ; the area with autumn " rybs " (*Brassica Rapa oleifera*) has increased by 360 ha. or 46 per cent to 1140 ha. *Jordbruk. FörenBl.* Jan., 1948.—R.P.J.

Research 916

A special Committee set up to review the organization of research in Sweden and to recommend changes in it has reported in a publication entitled " Betänkande angående organisationen av försöksverksamheten på jordbrukets område avgivet av 1945 års jordbruksförsöksutredning," Stockholm, 1947. After giving a brief history of the development of agricultural research in the country, the report reviews the general organization and work of the most important research and experimental establishments, questions of duplication of work and interrelations between research institutes, connexion between research and higher education, the relation between the experimental work conducted by the Agricultural College, Ultuna, and State agricultural research, the internal organization and local requirements as regards research activities, the experimental resources of Ultuna, the State experimental farms, the permanent experimental stations and fields and local experimental work with a section on the cultivation of local varieties and species.

Among the institutions reviewed are the Svenska Vall- och Mosskulturförening, Ultuna, Sveriges Utsädesförening, Svalöf, and Weibullsholm Plant Breeding Institute, Landskrona. The recommendations include one to the effect that the work of the Vall- och Mosskulturförening (Grassland and Bog Cultivation Association) should be included in the State research work, by transferring it to the Agricultural College and the State Agricultural Research Department now to be centred at Ultuna. The exception to this arrangement is the study-farm work, with regard to which the Committee accepts the Norrland Committee's proposal that this should be included in the Norrland Agricultural Research Institute. The Committee differs with regard to the pasture research work, although agreeing that the peatland work should be carried out by the State Agricultural Research Department. Pasture research includes special research and experimental problems of great economic importance for Swedish agriculture ; their solution depends on the cooperation with research workers on general agriculture, animal husbandry and plant breeding. Five members of the Committee consider that the pasture work should be transferred to the State Department, and dealt with by a special section, while four members propose the formation of an independent pasture research institute, the State Pasture Research Department, parallel with the Agricultural and Animal Research Departments.

Further details from this report will be provided on request.—R.O.W.

Seed Association 917

The Association held its annual conference in Uppsala on 11-12 July, 1947, which coincided with the 50 years jubilee of the Ultuna Branch Station. Professor Å. Åkerman read a paper on local or centralized plant breeding, and G. Carlsson gave a report on crop cultivation on the Ultuna Estate. Dr. E. Åkerberg dealt with the Ultuna Branch Station, the results of its work and its future tasks.—*Sverig. Utsädesför. Tidskr.* 57. No. 6. 1947.—R.P.J.

Finland

Barley 918

Balder barley has given a yield of 2300 kg. per ha., which is 300 to 400 kg. more than the yield of Binder under similar cultivation conditions. Balder is sown 12 to 13 days later than Binder barley.

The lower protein content of Balder grain (9.85 per cent compared with 12 per cent in Binder) makes it particularly suitable for malting. *Tidskr. Lantm.* Jan., 1948.—R.P.J.

Netherlands

Agriculture in 1948 919

The January number of the periodical published by the Agricultural Information Service (the *Maandblad voor de Landbouwvoorlichtingsdienst*) reviews the position of agriculture at the beginning of 1948. The severe winter of 1946-1947 had an adverse effect upon the crops harvested in 1947. Taking 1947 as the first normal year after the war and comparing it with 1939, it is interesting to observe that the area occupied by cereals has become reduced and the area devoted to potatoes, sugar and fodder beet and turnips has considerably increased. The area of permanent grassland was slightly lower in 1947 (1,228,179 ha.) than in 1939 (1,340,938 ha.). The numbers of live stock are rapidly increasing, but the provision of animal feed constitutes at present "the weak link" of agriculture in the Netherlands. The difficulty is due in the main to the shortage of cereals, the western European supply of cereals other than bread grain being 18 per cent less for 1947-48 than in 1933-37. The necessity for increasing production from pastures and forage crop areas at home is evident.

The restoration of the war-damaged lands is approaching completion, although the areas which had been flooded with salt water still give cause for anxiety, as the dry summer of 1947 resulted in the rising of salt. Even in Walcheren, however, good progress has been made.

In connexion with the restoration, an article by Engineer C. van de Berg in the same periodical describes the manner in which the Netherlands has drawn profit from the lamentable condition to which so large a proportion of her land was reduced. From the winter of 1944-45 onwards seven Government Departments and Institutes and several private foundations and firms have co-operated in a carefully organized scheme of research into the results of flooding and phenomena connected with it. While all the flooded areas have been included in the investigations, special attention has been paid to those inundated by salt and brackish water. Soil studies naturally compose a large part of the work, but there are also in progress studies of the susceptibility of different plants to (a) varying quantities of salt, (b) the impaired soil structure resulting from submersion under salt water; and studies of germination, rooting and growth in the damaged lands and of the quality of the crops produced. Grassland comprised the greater part of the land inundated by fresh water, and the Grassland Department of the Central Institute for Agricultural Research, Wageningen, has been especially responsible for the study of these areas. The chief aspects considered are methods of tillage, choice of seeds mixtures, natural recuperation as distinct from reseeding, and changes in botanical composition. The Institute has laid down a large number of observation and experiment plots throughout the whole of the Netherlands, some also in the regions which were inundated by salt water.—G.M.R.

Belgium

Seed Exchange 920

The Botanic Garden, Brussels, offers in exchange a selection of seed, particulars of which may be obtained from this Bureau.—D.B.

Restoration 921

The F.A.O. European Bulletin No. 2, 1947, gives information on the restoration of flooded territory in Belgium obtained from the Pedological Station of the University of Louvain. Instructions given to farmers are summarized as follows: (1) the use of gypsum, of calcium chloride and sometimes of ordinary lime; (2) careful ploughing as shallow as possible, choosing a time when the soil is neither too dry nor too wet; (3) heavy fertilizing, especially with nitrates.—G.M.H.

France

Seed Exchange 922

Vilmorin Andrieux (Service Scientifique) Verrieres-le-Buisson, Seine-et-Oise, offers, on an exchange basis, seed harvested in the year 1946-47 from botanical collections in Verrieres-le-Buisson (Seine-et-Oise). Particulars of genera and species offered and required by Vilmorin Andrieux may be obtained from this Bureau or from the above address.—D.B.

Mechanization 923

Mechanization is the essential feature of the agricultural section of the Monnet four-year plan (1947-50) for equipping French economy. More than half of the estimated expenses are allocated for agricultural machinery (180 out of 352 million francs). The plan for the mechanization of agriculture requires 200,000 tractors, divided among 7 models only. The need of fertilizers, insecticides, fungicides and weed destroyers has also been estimated. *F.A.O. European Bull.* No. 2, 1947.—G.M.H.

Switzerland

Sugar Beet 924

The policy of reducing arable areas on mountain farms because of reduced consumption of potatoes has been a disappointment to mountain farmers. It is hoped to replace potatoes with sugar beet and to set aside 5000 ha. for this crop. Such an increase in the area for sugar beet would require a new sugar factory at Andelfingen. In the crop rotation 5000 ha. of root crop corresponds with 20,000 ha. of cereal. Owing to low stocks of cereals there is an added reason for inducing peasants to vote for the sugar proposal on 14th March. *Alpw. MBl.* March, 1948. —D.B.

Spain

The Principal Cultivations 925

The greater part of the agricultural land in Spain is poor, due to the composition of the soil and to the low rainfall. Consequently, rotations follow two systems (a) alternate years, one year cereals, one year fallow, and (b) a three-year system, one year cereals, one year fallow, one year legumes. In order to increase fertility it is suggested that livestock populations be increased. Modern methods of cultivation are gradually being adopted. Wheat occupies the largest area (4.5 million ha.) with an average production of 8.5 met. gles. per ha. The north-east provinces (coastal areas excepted) produce most wheat. Average wheat production is 39 million gles., which is approximately the yearly internal consumption.

After wheat the most important winter cereals are barley, rye and oats. Maize is the most important spring cereal, but is not produced in sufficient quantity. The provinces which produce most maize are the northern ones along the Atlantic (dry farming) and Andalusia (irrigated fields). Rice cultivation occupies 50,000 ha. of irrigated land in the province of Valencia and on the delta of the Ebro with an average production of 62.5 gles. per ha.

The most important legumes are chick-peas, smooth tare, vetch, etc., cultivated on dry or irrigated fields. The cultivation of legumes is increasing to meet food and fodder needs and to increase soil fertility. *Surco*. Nov., 1947.—E.B.

Uganda

Cotton Crop **926**

Great concern at the progressive decline of the Uganda cotton crop in recent years was expressed by the president at the annual general meeting of the Uganda Cotton Association held on January 9. This year's estimate, he said, reached the low figure of 170,000 bales. Since 1931 the country had never produced such a small quantity of cotton, except in 1943 when the crop was only 111,000 bales. He gave as some of the reasons for the reduced crop late planting, pests and diseases, the need for suitable seed for each district and maize planting. *Crown Col.* March, 1948.—G.M.H.

Nyasaland

Experiment Station **927**

It is proposed to establish a station for general agricultural experimental work instead of a Tobacco Research Station. The need is urgent for investigations into systems of husbandry, management of live stock, crop rotation, pasture management, improvement in the yield and quality of native food crops by planting and cultural methods, investigations into the use of fertilizers for food and economic crops, and trials of mechanical cultivation and the implements required. *Crown Col.* March, 1948. —G.M.H.

South Africa

Oats and Barley Estimate **928**

"*The Farmer's Weekly*," *Bloemfontein*, for 14 January, 1948, gives the latest estimate by the Division of Economics and Markets of the Union's oats, barley and rye crops for this season as 2,463,000 bags (150 lb.) of oats, 840,000 bags (150 lb.) of barley and 479,000 bags (200 lb.) of rye. The figures are based on conditions prevailing at the beginning of December, 1947. The Cape Province is estimated to produce 1,864,000 bags of oats, 742,000 bags of barley and 402,000 bags of rye, the Free State 398,000 bags of oats, 13,000 bags of barley and 75,000 of rye, the Transvaal 194,000 bags of oats, 85,000 bags of barley and 2000 bags of rye and Natal 7000 bags of oats. —G.M.H.

India

Oil Seeds **929**

The new Government on Oct. 16, 1947, inaugurated the "Indian Oil Seed Committee," to investigate problems of marketing, prices and transportation, both within and outside the country, and long-range production and development programmes. A major function of the committee will be to try to increase domestic utilization of oil seed by expanding the crushing industry and exporting the surplus oil. India is one of the world's largest producers of oil seeds, ranking first in peanut production, second in rape seed, sesame and castor beans. In 1938, which was considered a normal year, vegetable oil seeds, oil and oil cake represented 12 per cent of the total value of exports. In view of the world shortage of fats and oils and India's need for foreign currency for essential imports, it may be found advisable to permit the exports of oil seeds for at least a few years. *Soybean Digest*. Feb., 1948.—P.M.

Australia

Silage from Japanese Millet **930**

Dairy and mixed farmers in New South Wales sowed a considerable area of land to Japanese millet during the 1947 season, and heavy rainfall resulted in prolific growth. In some districts, the millet was taller than the cattle that grazed it. Fed to stock, and, where conditions permitted, grazed, the millet gave increased milk flow in comparison with pastures, but in many cases the crop reached heading stage in great quantities.

Australian Government agronomists advised growers not to waste the valuable fodder, which often exceeded 10 tons to the acre, but to make it into silage. Pit or overhead silos are the most satisfactory from the point of view of loss, but where such silos were not available, growers were advised to cut the millet at heading stage and immediately build it into stacks which were high rather than large of base. After stacking, the millet was covered with grass or straw, and weighed down with wires over the top, to which such weights as posts or logs were attached to keep the stack in position.—*Australian Rural Reference Newsletter*, March 8, 1948.—G.M.H.

West Indies

Development Report **931**

It is the opinion of the Development and Welfare organization that the greatest need of the British West Indies today is the "most intensive use of the land according to methods of good husbandry, both for export crops and local food crops. In no other way can a growing population be supported or the demands for higher standards of living be met." To attain this, far-reaching reforms in the basic methods now employed and improved educational facilities and efficient advisory services are necessary. The report reviews the various measures so far undertaken to assist peasant agriculture, e.g. the development and improvement of extension services in the various Departments of Agriculture, the establishment of experimental stations and demonstration stations. Soil conservation practices are being widely adopted and grass is being introduced as a rotational crop. *Development and Welfare in the West Indies* 1945-46. Report by Sir John McPherson. London, 1947.—G.M.H.

Cotton Experimental Station 932

Under the Colonial Development and Welfare Act of 1940, funds have been provided for the establishment of a cotton experimental station in Antigua under the direction of the Cotton Adviser and the Agricultural Adviser, to benefit all cotton producing islands.—G.M.H.

U.S.A.

Hybrid Corn Seed 933

One of the aims of the Food and Agricultural Organization (FAO) of the United Nations is the exchange with other nations of technical knowledge on agriculture. As part of this service arrangements have been made for supplying 28 bushels of hybrid corn seed for field tests in Europe. The seed will be sent to experimental stations in Austria, Czechoslovakia, Hungary, Italy, Poland and Yugoslavia in time for spring planting in 1948. This follows up work begun at the hybrid corn demonstration school at Bergamo, Italy, last August. Corn production in Europe in 1947 had declined by 78.8 million bushels from the pre-war 5-year average of 677.7 million bushels. Production is principally in the Danubian countries and in Italy.—P.M.

Mexico

Flora 934

Professor Casiano Conzatti is producing a taxonomic flora of Mexico (Flora Taxonómica Mexicana) in 12 volumes. The first volume of 440 pages, containing the ferns and the Gramineae, has now appeared (11 pesos Mexican currency). It is published by the author, Sr. Prof. Casiano Conzatti, Calle de Gómez Far as 3, OAXACA, Oax., MEXICO.—*Bol. Soc. bot. México* 5. 1947.—G.M.R.

Tipuana Lundelli St. 935

This species of the Leguminosae, hitherto recorded for Honduras and Guatemala only, has now been found by Dr. B. P. Reko in Mexico. The genus is recorded for Mexico for the first time. *Bol. Soc. bot. México* 2. 1945. G.M.R.

Argentina

Society of Agronomy 936

Professor Arturo Burkart, Director of the Darwinion Institute of Botany at San Isidro and Professor of Crop Husbandry in the University of Buenos Aires, has been elected President of the Argentine Society of Agronomy for the period August, 1947, to August, 1949. *Rev. argent. Agron.* Dec., 1947.—G.M.R.

Brazil

Plants and Seeds Exchange 937

The Department of Botany, Faculty of Philosophy, Science and Letters in the University of São Paulo, publishes in *Botânica* No. 5, 1947, a list of plants and seeds offered in exchange. It includes the following species of the Papilionaceae :

Andira humilis Mart., *Crotalaria anagyroides* H.B.K., *Crotalaria stipularia* Desv., *Eriosema crinitum* E. Mey., *Indigofera suffruticosa* Mill., *Sweetia dasycarpa* Benth., *Tipuana speciosa* Benth., *Zornia diphylla* Pers.
No grasses are listed. Address : Departamento de Botânica, Caixa Postal 105-B, São Paulo, Brazil.—G.M.R.

Chile

Natural History Museum 938

Professor Rebeca Acevedo de Vargas, author of work on the Chilean grasses (see *Herb. Abstr.* 7. Abs. 290, 9. Abs. 323, 10, Abs. 618, etc.) has been appointed Head of the Department of Botany of the Natural History Museum at Santiago, in which she was previously an Assistant. *Rev. argent. Agron.* Dec., 1947.—G.M.R.

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FIELD CROP ABSTRACTS

LAND UTILIZATION AND MANAGEMENT

Schildknecht, H. **Reclamation in Switzerland.** *Reclam. Era* **34.** 65-6 and 76. 1948. [Fed. Inst. Technol., Zürich, Switzerland] **939**

In pre-war years Switzerland's agricultural productivity was limited by nature and the country was dependent on the import of foodstuffs. During the war, in the interests of the preservation of her independence, one of the most important problems was that of increasing agricultural production. About 1,250,000 acres were necessary in order to make the country self sufficient ; in 1939 there were about 500,000 acres of arable land in the country. A considerable amount of pasture land was ploughed up. Additional arable land was reclaimed by the draining of swamps, irrigation, and the clearing of unprofitable woodland. Further increased agricultural productivity was brought about by the improvement of farming conditions. The main drawback was the fragmentation of agricultural property. To overcome this, the old property boundaries were abolished and an attempt has been made to hand to each farmer the total amount of his previous holdings in one single lot. The reclamation programme was considered to be one of the most important factors of national defence ; the Federal Government and the cantons granted substantial subsidies and the whole banking system granted loans for reclamation at a very low interest rate. Cultivation of reclaimed land was given great attention. A new law stipulated that private businesses employing 50 or more labourers or office workers, would be responsible for cultivating land. Many businesses have joined together in farming associations, headed by farming experts, and have financed the cultivation of the reclaimed land.—p.m.

Astiazaran, A. A. Regadios en Galicia. [**Irrigation in Galicia.**] *Agricultura* **16.** 110-3, 163-7, 208-13 and 260-6. 1947. **940**

An account is given of irrigation in Galicia which benefits over 100,000 ha. of land. The water is distributed through a network of canals, fed by rivers, rivulets and springs, the work having been carried out by the farmers. Maize, the principal crop of this region, grassland and horticultural crops, are irrigated.

Galicia, a mountainous country, has the highest rainfall of Spain (1452 mm. per annum), even so the benefits of irrigation have been felt. The sowing of maize is done between the beginning of May and middle June, after the winter harvest ; the flowering takes place at the end of July or beginning of August, the maturation in October. Rainfall during July-August, the period of the maximum development of the plant, is very low, and it is during this period especially that irrigation is given in order to reach the highest yield. In Galicia irrigation has the purpose of correcting the irregularities of rainfall. If irrigation water is not available, the sowing is anticipated to the first half of April and short cycle varieties are used which reach maturation before the dry season, making the best use of the spring rains. In this way the highest yield without irrigation is obtained, but the winter crops are reduced or eliminated. The yield of maize in dry farming is 1500-2000 kg. per ha. The advantage of irrigation is clear ; the winter cultivations can take place and the yield of maize (with long cycle varieties) is 3000-3500 kg. per ha., which means an increase of 75-100 per cent.—e.b.

ТЮТИН, В. Размещение сельскохозяйственного производства и сочетание отраслей в колхозах Ленинградской области. *Соц. Сельс. Хоз.* 1947. *No.* 2. стр. 38-45.

Tjutin, V. [**Disposition of agricultural production and unification of kolhozes in the Leningrad province.**] *Soc. seljs. Hoz.* 1947. No. 2. pp. 38-45. **941**

The factors affecting production in this region are discussed with special reference to geographical, economic and social aspects. The following data show the percentage of total sowings during 1913 and 1939 respectively : winter crops (rye, wheat) 45.4 and 23.3 ; total cereals and grain legumes 82.6 and 54.3 ; flax 7.0 and 10.2 ; potatoes 6.2 and 9.1 ; vegetables 0 and 2.1 ; annual and perennial herbage 4.0 and 23.0 ; root and silage crops 0 and 1.0.

The plans for development of the sowings in 1950 and 1952 are outlined (in tabular form) for the area which can be divided into four zones. The first zone is characterized by intensive vegetable production and animal husbandry in the Leningrad suburban economy ; the second is similar, but production is less intensive ; the third comprises the Karelian isthmus ; and the fourth zone is the area of least intensive farming, with animal husbandry and cultivation of potatoes and other vegetables.

The following table concerns the plans for the first zone and is typical of the information supplied for each of the other three. The figures are percentages of total area sown.

Crop	Year 1945	1950	1952
Winter sowings ..	17.1	12.0	12.0
Mown perennial herbage	5.0	21.0	27.0
Fallow	22.2	10.2	9.5
Grains	32.1	28.1	22.7
Potatoes	13.1	15.0	15.0
Vegetables	8.7	9.9	9.9
Roots and silage ..	1.7	3.8	3.8

—M.H.

PALESTINE, Audit Union of the Workers' Agricultural Co-operative Societies Ltd. **The Palestine agricultural economy under war conditions.** 1946. pp. 51. [Received 1948] **942**

A review of the nature, development and essential features of Jewish agriculture in Palestine and of the agricultural economy in that country under war conditions. By 1944, 95 per cent of all the areas under barley in the collective settlements and co-operative smallholders' villages was sown with selected seeds and of the total area under wheat 69 per cent was sown with new varieties (a cross between an Australian soft variety and the hard Moroccan variety). Cowpeas, Sudan grass, Rhodes grass, *Setaria* and *Penicillaria* are among the several new fodder varieties that have been introduced. The supply of seeds for Palestine agriculture has ceased to be dependent on imports and has become a regular feature of farming.—G.M.H.

AGRONOMIE TROPICALE. Possibilités agricoles du bassin du Logone. [**Agricultural possibilities of the Logone basin.**] *Agron. trop.* **3.** 115-39. 1948. **943**

The Logone river, which flows into Lake Chad, has a basin of about 135,000 km² with a population of 843,000 inhabitants. The fertility of the land is medium. It was only in 1930 that its economic development was started with the introduction of industrial crops (cotton and rice), and the organisation of transport, etc. It is thought that the adoption of new cultural methods will further the rapid agricultural development of this region.

Millet (white and red) is the basic food for the natives who also grow sorghum and tobacco and several legumes: groundnut, kidney bean, pumpkin.

Three zones are determined by climate: the pre-Saharan zone, the Sudanian zone, and the pre-Guinean zone. From south to north the quantity of rain diminishes and the rainy season is reduced from 7 to 3 months under which conditions cultivation becomes aleatory. As the periodical floods of the river cover large areas of land in the pre-Saharan zone, the best utilization of this water to extend the cultivating period and to develop the rice cultivation is under study.—E.B.

AUBREVILLE, A. Ressources sylvo-agricoles et sylvo-pastorales des territoires africains à longue saison sèche, leur avenir. [**Forestal-agricultural and forestal-pastoral resources of African territories with a long dry season, and their future.**] *Agron. trop.* **2.** 358-68. 1947. **944**

The greater part of French Africa, south of the Sahara (Senegal, Guinea, Sudan, north Ivory Coast, Togo and Dahomey, Niger, North Cameroons, Oubangi-Chari, and Chad) is within the zone of tropical climate which has a long dry season. The influence of the Sahara is felt during the dry season with torrid desiccating winds, while only during summer the monsoon of the Atlantic brings moisture and rain. Climate is the cause of the poverty of these countries where a sparse population finds scarce sustentation in cultivating rice and millet.

The author examines the possibilities of introducing improvements in the agricultural and pastoral situation. The cultivation of groundnut for export should be controlled: it has been successfully cultivated, but is now in decline owing to the exploitation of the ground. Trees and arborescent plants are a shelter against wind and maintain the moisture in the ground: they should be increased everywhere giving preference to species which give useful products such as the Shea butter tree (*Butyrospermum*) and the Kapok. The dry pre-desertic zone, steppe-like, with few trees deprived of any cultivation, has to a certain extent rearing possibilities, water being supplied by rivers and lakes (Niger, Chad, etc.), while in the less dry zone the vegetation grows so high and hard that it can provide no food for live stock.—E.B.

HENRY, R. Le problème des eaux et des terres alunées de l'ouest Cochinchinois. [**The problem of aluminous waters and soils in west Cochin China.**] *Agron. trop.* **3.** 180-9. 1948. **945**

Rice cultivation of west Cochin China is under the continuous menace of aluminous waters. These waters are so called because they contain in solution toxic salts, chiefly sulphates of aluminium and iron. They may be so acidic as to have a pH value below 3. It is believed that the subsoil is glutted with these salts and the circulating waters carry them into the fields. The contamination of the fields by these aluminous waters is revealed by the presence of reeds, *Heleocharis equisetina* the colour and size of which vary with the grade of toxicity of the ground. Wise management of the irrigation waters and various cultural devices are suggested. Above all, long periods of drought which favour the ascent of the underground water are to be avoided if possible.—E.B.

ILLINOIS Agricultural Experiment Station Bull. 522. **How productive are the soils of central Illinois?** By *R. T. Odell.* 1947. pp. 373-89. **946**

The farm lands of Central Illinois consist of many different soil types, the most common of which are described. Since 1938, the Agronomy Department of the University of Illinois has been mapping the soils and collecting records of crop yields and soil treatment practices on these farms. These long-time records (10 and 20 years) show how much the crop yields differ with the various soil types and the extent to which poor or fair crop yields can be increased by improved farm practices.—P.M.

BROWNING, G. M. **Save that soil.** *Iowa Fm Sci.* **2.** 3-5. 1948. **947**

For the past 16 years, soil and water losses have been measured on plots at the State Experimental Farm. Each plot measuring 1/100 of an acre, was bounded by a steel border to prevent water falling on the plot from being lost over the sides, and at the lower end had a concrete tank to catch everything that ran off. The soil was a Marshall silt loam with an average slope of 9 per cent and the average length of slope 400 ft. It was found that former land use considerably affected the amount of soil and water lost. Average yearly soil losses in tons per acre after different cropping systems were as follows :—continuous corn 38.2 ; rotation corn, oats and meadow, 9.6 ; corn 18.4 ; oats 10.1 ; meadow 0.2 ; continuous alfalfa 0.1 ; continuous wheatgrass 0.03 and continuous corn on subsoil 51.6. The annual loss from continuous corn thus amounts to about one-third of an inch of top soil.

Long slopes, or steep slopes added to the erosion problem. In these experiments when the length of slope was doubled, soil losses increased 2.6 times and in Missouri, a similar experiment showed that a 12 per cent slope lost 4.7 times as much soil as a 4 per cent slope. The rate of rainfall was as important a factor as the amount. Out of 128 rains that caused run off, 4 were responsible for about 40 per cent of all soil lost. The heavy-driving rains of May and June did much damage, for in these months the soil is ready for planting, and it is left exposed. Two-thirds of the soil lost from corn ground and four-fifths of the soil lost from oats was washed away in April, May and June of each year.

Data is given of soil and crops conserved by contouring, strip cropping, terracing, crop residues and grassed waterways, and the article concludes by stressing the absolute necessity of conserving soil on Iowa farms.—P.M.

SHEPHARD, C. Y. **Peasant agriculture in the Leeward and Windward Islands.** 1945. pp. 211. [mimeographed] [Imp. Coll. Trop. Agric.] **948**

An enquiry into the advantages and disadvantages of (a) peasant freehold ownership, (b) tenancy, (c) share cropping or metayage, and (d) cane farming, and the relationship which it is desirable to establish between these various systems and estate agriculture. It also includes an investigation into " what constitutes the best size of holdings for small holders of African and East Indian descent (a) whose holdings constitute the holder's sole means of support, and (b) who can serve some part time employment on estates or elsewhere".

The enquiry is divided into three sections. The first section deals with the development of peasant agriculture, the second with land settlement and the third includes a discussion and recommendations.

It is recommended that the present practice of ruthless exploitation of the soil must give way to a system which ensures the maintenance of fertility. The farmer must observe the rules of good husbandry in the management of his farm. There is more than one system of agriculture which fulfils this requirement, but the one which has the widest application is mixed farming. Certain basic rules which the mixed farmer must observe are listed and include (a) the farmer must reside on his farm, (b) livestock must be kept on the farm, (c) at least one " cattle unit " must be maintained for each acre of land in arable crops, (d) a certain proportion of the farm must be maintained in fodder or forage grasses, (e) the farmer must manufacture farmyard manure and apply it to the farm. The mixed farms as visualized by the writer, would be 3.5 or more acres in area, on which the farmer, his family and his live stock would live. The smaller farm might be divided as follows : homestead 0.5 acre ; fodder grasses, 1 acre ; arable crops, 1.5 acres ; and the larger farm in the following manner : homestead, 1 acre ; fodder grasses, 1.5 acres and arable crops 2.5 acres. One hundred and twenty-two tables supplement the text.—G.M.H.

AGRONOMIE TROPICALE. Avenir agricole de la Réunion. [**Agricultural prospects of Réunion island.**] *Agron. trop.* **2.** 563-91. 1947. **949**

The population of Réunion island, which is 250,000 inhabitants living on 50,000 cultivated hectares (giving a density of 500 per km^2) derive their means of existence from agriculture, chiefly from cultivation of sugar cane. Sugar, alcohol, vanilla and essential oils are the products for export. The difficult economic conditions due to overpopulation became critical during the war owing to the difficulty of importing rice and other food products. The sugar canes were to a large extent pulled up and replaced by maize to provide food for the population. The author believes that it is advisable to maintain to a certain extent the cultivation of maize which is grown in rotation with sugar cane and leguminous plants (kidney-bean and groundnut). Leguminous plants such as *Cajanus indicus*, *Mucuna utilis*, *Dolichos lablab*, *Phaseolus lunatus*, are grown also as cover crops. Sweet potato is usually grown in rotation with sugar cane.—E.B.

WASHINGTON, Pan American Union, Division of Agricultural Co-operation. Amer. Agric. Ser. **Agriculture in Venezuela.** 1947. pp. 35. **950**

A useful, short survey of Venezuela, its physical and social characteristics and its agricultural economy in particular, is presented. Crop production, pp. 10-18; livestock industry, pp. 20-24.—G.M.R.

PORTILLO, G. A. El avión como auxiliar en los estudios geográficos. [**The aeroplane as an aid to geographical study.**] *Gaea* **7.** 163-83. 1945. [Received 1948] **951**

An exposition is presented of the technique of aerial photography, with suggestions for its application to land survey, and, among other things, agricultural planning.—G.M.R.

FARMING SYSTEMS

PHILLIPS, R. **Catch crops for autumn and spring feeding.** *Farming* **2.** 146-8. 1948. [Dept. Anim. Health, U.C.W., Aberystwyth] **952**

The most commonly grown catch crops in this country belong to the three groups: cereals, legumes, and brassicas. Italian ryegrass also serves a useful purpose. Of the cereals, rye and oats are commonly used; vetches and tares, peas, beans and certain types of clovers constitute the legume groups. Among the brassicas, rape and/or turnips are extensively used on poor soils, while mustard, the leafy kales, and cabbage are also popular, especially in the lowlands.

Catch crops are grown as blended mixtures and not as single species, the choice of crop being influenced by a variety of factors such as soil and weather conditions, purpose, time of sowing and cost of seed. Brassicas make suitable single crops and/or mixtures for autumn feeding; for early spring feeding winter rye or winter oats and vetches, sown from July to September, do well. Details are given for cereal and legume mixtures, the brassicas and Italian ryegrass.—G.M.H.

UPPSALA, Jordbrukstekniska Föreningen. Medd. No. 63. Skördetröskdrift vid tvenne skånska storjordbruk. [**Combining on two large farms in Scania.**] By *G. Ringborg*. 1939. pp. 56. [Received 1948] **953**

An account of the organization of farm management on the Axelvold estate in West Scania, 7 km. north of Svalöf, comprising 250 ha. agricultural land and 75 ha. woodland, and on the Tarstad estate, 12 km. from Axelvold, consisting of 211.5 ha. arable land and 20 ha. pasture land. On both estates the combine harvester is in use and in the report attention is paid chiefly to its effect on the cultivation plan.—R.P.J.

БЕНЕДИКТОВ, И. За мощный подьём зернового хозяйства. *Соц. Сельс. Хоз.* 1947. *No.* 2. стр. 9-14.

BENEDIKTOV, I. [**Measures for great improvement in grain husbandry.**] *Soc. seljs. Hoz.* 1947. No. 2. pp. 9-14. **954**

Increased grain yields in USSR should be achieved by improved agronomical measures combined with a suitable rotation which includes both a herbage and a fallow course. It is anticipated that in 1949 all kolhozes will have introduced a rotation into their system of farming. Apart from carrying out certain measures of cultivation, attention should be given to improving crop varieties, to ensuring purity of sowings, and to choosing suitable sowing dates.

In the pre-war period the highest grain yield was obtained in 1937 and was attributed to the large area ploughed in autumn. In the south-eastern areas the use of spring wheat is most desirable, but winter wheat gives good yields in the Ukraine, in the Krasnodar and Stavropol territories, in the Crimea, Voronež, and Kursk provinces, and in the Moldavian Republic. It is anticipated that in 1949 the pre-war level of grain production will be achieved.

Plans for increasing grain production in other regions of USSR are outlined, notably in Siberia, the Urals, and the north-east. Attention is drawn to the undesirable tendency to limit the area of spring wheat production on the fertile Ukraine soils by extending the sowings of less valuable grain, such as barley. Maize should be extended in the south. In 1940 yield of maize was 21.7 centners per ha. in the Ukraine. Millet, and grain legumes such as peas, beans and lentils, are considered in the plans for future production.—M.H.

BROWN, D. D. **Dark fire-cured tobacco culture in Southern Rhodesia.** *Rhod. agric. J.* **44.** 674-93. 1947. **955**

The various soil and climatic requirements, and cultivation, harvesting and curing methods for the successful production of dark fire-cured tobacco are given. One 3-course rotation (tobacco/maize/legume, ploughed under), and two 4-course rotations (tobacco/cotton/maize/legume, ploughed under, and tobacco/maize/legume, for hay, stubble ploughed under/grass, for hay, stubble ploughed under) are suggested.—G.M.H.

MORROW, J. A., KILLEEN, N.C., and BATH, J. G. **Development of clover-ley farming at Rutherglen research station.** *J. Dep. Agric. Vict.* **46.** 13-20 and 39-40. 1948. [Rutherglen Res. Sta.] **956**

Clover-ley farming is described as " the rotation of cereal cropping with subterranean clover pastures, irrespective of whether the cropped land is fallowed or not." Experiments have shown that the system results in improved soil fertility and higher crop yields. Based on this evidence a comprehensive series of long term experiments was commenced in 1940 to study the changes in soil fertility on a paddock under clover since 1926 and then cultivated under the following systems: (a) fallow/wheat, (b) wheat/wheat/clover/clover, (c) wheat continuously. A comparison of the results from the three rotations is given in the following table:

	Average wheat yields for two years.		Three years wheat/three years clover rotation
	Fallow/wheat rotation	Wheat/wheat clover/clover rotation	
	bus./acre	bus./acre	bus./acre
1st year	Fallow	31.6	30.9
2nd ,,	36.3	42.3	43.0
3rd ,,	Fallow	Clover ley	40.8
4th ,,	36.4	,, ,,	Clover ley
5th ,,	Fallow	32.4	,, ,,
6th ,,	31.8	37.6	,, ,,
Total return after 6 years	104.5	143.9 plus 2 years grazing	114.7 plus 3 years grazing

It is pointed out that these results apply to Rutherglen and similar districts, but some modification of the practices recommended is necessary in drier districts. Sections of the experiments are devoted to a study of the fertilizer requirements of crops grown in clover rotation and to the cultivation practices in clover-ley farming. Other experiments have been laid out to obtain information regarding the time necessary to raise appreciably the soil fertility by turning the land out to clover pastures and to compare the trends of fertility under various cropping systems, other than those involving long periods under pasture, and under conditions similar to those at Rutherglen.—G.M.H.

MILLER, E. E. **Geography of Grant county, Washington.** *Econ. Geog.* **24.** 19-27. 1948. **957**

Farming is the leading economic activity of the county and wheat is the major crop. There are two main types, dryland and irrigated farming, but in the main, all areas having deep soil and sufficient moisture are given over to dryland farming. Both winter and spring wheat are grown; many farmers grow some of each with spring wheat occupying the larger acreage. Winter wheat will often yield a few more bushels per acre and bring a higher price per bushel, but it is subject to heaving, winter killing and winter mold. Spring wheat is not subject to any such danger but is more likely to suffer from drought because it matures about 2 weeks later. The average acreage for both winter and spring wheat from 1900 to 1940 was 145,000 acres, production average for the same years was 1,455 million bushels and average yield 10.0 bushels per acre. Irrigated farming is given over to horticultural crops.

Because the range is too dry in summer and other crops offer more return per acre than pasture for dairy cattle, beef cattle are much more important than dairy cattle. The common practice is to graze cattle on the scabland during the summer and on stubblefields and winter wheat or rye during the fall and spring. During the winter, cattle are fed hay, grain and chaff, which usually contains some grain.—G.M.H.

CROPS AND CROP PRODUCTION

HÅKANSSON, R. Jordbruksforskningens praktiska betydelse. [**The practical importance of agricultural research.**] *Svensk Jordbr. Forskn. Årsbok* 1947. 7-18. **958**

Swedish agriculture has in recent decades undergone very marked development. From the beginning of the eighth decade of the nineteenth century to the third decade of the twentieth century crop units per ha. from arable land increased from 1470 to 2200. A comparison between the yields of different crops during the 1880's and those obtained during the years 1931-1940 indicates that in cereals autumn wheat shows the largest yield increase, 68 per cent. Then follow mixed grain, oats, barley and autumn rye with between 44 and 36 per cent. The increased yield for potatoes is 85 per cent, for sugar beet 34 per cent, for fodder root crops 130 per cent. The yield from hay leys shows an increase of 28 per cent.

The article also deals with the importance of rational manuring, plant diseases and weed control, increased mechanization, animal production, improvement of quality of forage crops, and the mineral requirements and health of domestic animals.—R.P.J.

STEHLÍK, V. Mák setý do cukrovky. [**The combined cultivation of poppy and sugar beet.**] *Sborn. Ceskosl. Akad. Zemed.* **19.** 170-2. [English and Russian summaries, p. 172] 1946. **959**

By order of the Authorities of the Protectorate experiments were conducted during 1942-1944 and a preliminary report on the advantages and disadvantages of combined cultivation is given. The yield of the poppies depended on their proximity to the sugar beet, the density of growth of the latter and the number of poppies per $1 m^2$. The average yields of one poppy plant in grm. were:

Field	A	B	C	D
Poppy alone	5.6	18.7	18.9	19.25
Poppy and sugar beet	5.0	17.0	22.4	26.1

The yield on per ha. varied between 10 and 885 kg. of poppy seed, according to density of seeding. When the sugar beet grew close to poppies, a reduction of 0.1—1 per cent in sugar content was observed.—K.A.A.

STEHLÍK, V. Mák vsetý do cukrovky a vývoj obou plodin. [**The combined cultivation of poppy and sugar beet and their development.**] *Sborn. Ceskosl. Akad. Zemed.* **19.** 214-22. [English and Russian summaries, pp. 221-2] 1946. **960**

Detailed account of the experiments is now given. The yield of seeds of poppies growing in combined cultivation was 4.5—38.7 grm. per plant. Poppies growing close to the sugar beet gave yields 15 per cent lower. The yield per ha. (1 plant per $1 m^2$) varied between 45—587 kg., according to soil and year of cultivation. The results are from untouched (not thinned) fields. In practice the yields are much lower.

The sugar beet crop was largely influenced when the poppies grew in close proximity. The weight of the leaves was reduced by 13—35 per cent and the weight of the root by 12—45 per cent. The sugar content fell by 0.1—0.45 per cent. When poppies and sugar beet were sown and cultivated in alternate rows the larger area per plant was to the sugar beet's advantage and the weight of the leaves was −11.1 to +28 per cent below or above normal. The weight of the roots +5 to +47 per cent, the sugar content −0.40 to +0.35 per cent.

The yield per ha. did not fall so much, when the poppies grew close to the sugar beet.

The disadvantage of combined cultivation were mainly difficulties in the performance of cultivation and manual labour, but also in the reduction of sugar content and weight of leaves, which both mean a loss to the farmer. This wartime measure is therefore not recommended in peace time.—K.A.A.

TIMSON, S. D. **Alternative green manure crops.** *Rhod. agric. J.* **44.** 618-24. 1947. **961**

This bulletin contains notes on crops and mixtures which are considered suitable alternative green manures to Sunn hemp. They are recommended as likely to give results equal or superior to a late-sown crop of Sunn hemp in respect of yield increases in the two following maize crops. Among the weed-smothering crops are listed sunflowers and upright cowpeas; sunflowers an velvet beans; sunflowers alone; Sunn hemp an munga (m'youti); munga (m'youti) and cowpeas Velvet beans and cowpeas are green manure which require cultivation. Lupins and soybean are suggested as green manures for the Easter Border Highlands.—G.M.H.

ROSS, A. A. **The growing of green manure crop in the orchards of the Stanthorpe district.** *Qd agric. J.* **65.** 389-95. 1947. **96**

Of New Zealand blue lupins, golden tares field peas, tick beans, vetches, clovers, Blac Winter rye, wheat, barley, and oats,—Nev Zealand blue lupins and Black Winter rye are considered the most successful green manure crops t grow in the orchards of the Stanthorpe district.—G.M.H.

CROOKS, D. M. **Plants for special uses.** *Econ Bot.* **2.** 58-72. 1948. [U. S. Dept. Agric.] **96**

The author reviews several medicinal, insecticidal and oil-producing plants which are eithe cultivated in a small way or are obtained in U.S.A from wild plants. Among the medicinal plant are: belladona (*Atropa belladonna*), henban (*Hyoscyamus niger*), stramanium (*Datura Stramanium*), digitalis (*Digitalis purpurea*) and ergot (th sclerotium of a fungus that grows on rye grai while it is developing in the seed head). Insecticidal plants reviewed are: pyrethru (*Chrysanthemum cineraviaefolium*), derris (*Derri* spp.), cube (*Lonchocarpus* spp.) and a weed calle "devil's shoestring" (*Tephrosia virginiana*). Oi plants include: castor bean (*Ricinus communis*) Some tannin-yielding plants and plants that yiel flavours are also noted.—P.M.

UNITED STATES, Department of Agriculture, Circ No. 771. **Ammonium nitrate for crop production.** By *C. W. Whittaker, B. E. Brown,* an *J. R. Adams.* 1948. pp. 28. **96**

The role of ammonium nitrate in crop production in the U.S.A. is reviewed. Mention is made o the numerous experiments which have demonstrated the efficacy of nitrogen in promoting cro yields. Ammonium nitrate fertilizer can be applie by hand but for large areas, a fertilizer distributo proves more satisfactory. Cotton, as well as bein fertilized at planting with a complete fertilizer generally needs further nitrogen. This is usuall applied as a side dressing after the crop has bee chopped; ammonium nitrate may be applied i this way at rates of 80 to 100 lb. per acre. In th south-western and Southern states, most experimental stations advocate side dressing of corn wit nitrogen fertilizer. This should be done when th corn is 12 to 18 inches high at rates of 100 to 200 lb of ammonium nitrate per acre. Wheat, oats an other small grains give good response to spring top dressings of nitrogen in most of the south-eastern and east-central states. Suggested rates of application are 60 to 120 lb. of ammonium nitrate per acre, applied broadcast.—P.M.

ECONOMICS OF CROP PRODUCTION

EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE (Department of Economics). Bull. No. 8. **Economic aspects of farm mechanization. Combine harvesters in east and south-east Scotland 1946.** By *H. Christine McIver*. 1947. pp. 13. [mimeographed] **965**

Results of an enquiry into costs and performances of 22 combine harvesters in the east and south-east of Scotland for 1946. The percentage of the grain grown on each farm which was combined was considerably higher in 1946 than in 1945 for each type of grain and for all grain. The average percentage of the wheat grown which was combined rose from 38 per cent to 42 per cent. The percentage of barley rose from 80 to 86 per cent and the percentage of oats from 24 to 32 per cent. The percentage of all grain grown to be combined rose from 50 to 56 per cent. This rise was very probably due to the bad harvest weather which induced many farmers to combine, and so save grain which they had originally intended to harvest with a binder. Fourteen tables include information on average costs per acre, and per hour for 5-6, 8-10 and 12 feet combines. [See also *Fld. Crop Abstr.* 1. *Abs.* 68].—G.M.H.

READING UNIVERSITY, Department of Agricultural Economics. Fmrs' Fin. Rep. No. 9. **Financial results on 189 farms in the Southern Province. 1946-1947.** By *G. B. Bisset*. 1948. pp. 13. [mimeographed] **966**

MACHINERY AND EQUIPMENT

HAYLES, W. A. **Getting the best from a combine harvester.** *J. Minist. Agric.* **55.** 104-7. 1948. [N.A.A.S., East Suffolk] **967**

The combine harvester must be carefully fitted into the general system of farming on the holding where it is to work and must also be backed by a well-planned organization, both on and off the field, if the best results are to be obtained. Suggestions on field technique, setting and adjustment (with a table of faults and causes), care and maintenance and straw disposal are presented.—G.M.H.

SWANSON, D. W. J. **A practical approach to the Ferguson system.** *Fm Mech.* **2.** 53-5. 1948. **968**

Brief notes on the Ferguson tractor and on the principal Ferguson soil-moving equipment. Apart from such refinements as adjustable wheel-track widths, self-starter, coil ignition and independent brake control, the chief point of interest lies in the inbuilt hydraulic depth control and lift for the soil working implements the tractor carries.—G.M.H.

FARM IMPLEMENT MACHINERY REVIEW. **" Bean" Seeders are now in production.** *Fm. Impl. Mach. Rev.* **73.** 973-4. 1948. **969**

Descriptions of the " Bean" hand seed drill and seeder units. All seeds from lettuce to peas and beans, including segmented beet can be drilled efficiently and with complete consistency by the seeder's mechanism.—G.M.H.

POWER FARMER. **The Wrigley hoe.** *Pwr Fmr* **2.** 130-1. 1948. **970**

This single wheel hoe is claimed as the narrowest motor hoe on the British market. It is only 10 in. wide at the wheel centre, which is 12 in. from ground level. Details of working and a brief specification are given.—G.M.H.

HINE, H. J. **Threshing grass and linseed.** *J. Minist. Agric.* **55.** 101-4. 1948. [Min. Agric. and Fish.] **971**

Practical details for the threshing of grass seed, clover seed and linseed are presented. The threshing of linseed, under some conditions, has proved to be awkward, " but once the peculiarities of the crop, and its differences in behaviour, compared with a corn crop, have been understood and reckoned with, a good job of threshing can be relied upon, provided the machine is in sound condition and adjusted correctly." The important difference between threshing linseed and threshing a corn crop lies in the lower speed of throughput that can safely be reached.—G.M.H.

UPPSALA, Swedish Institute of Agricultural Engineering. Medd. No. 206. Skötsel och justering av självbindare. [**Care and adjustment of the self-binder.**] By *S. Alwerud* and *Y. Andersson*. 1947. pp. 76. **972**

Revision of Medd. No. 54 of the Swedish Association of Agricultural Engineering. The text has been amplified and the number of illustrations increased. The usefulness of paper binder twine is discussed.—R.P.J.

ШАПОВАЛ, А. Г. Узкорядный сев. *Совет. Агрон.* 1947. *No.* 4. стр. 27-34.

ŠAPOVAL, A. G. [**Narrow-rowed sowings.**] *Sovet. Agron.* 1947. No. 4. pp. 27-34. **973**

In grain crop sowings the importance of uniform depth and spacing of the seeds cannot be overestimated. A space of 15 cm. between rows is unsatisfactory because, in an elongated area of

15 × 1.5 cm., individual plants are in competition for light, moisture, nutrients, etc. and weeds tend to establish themselves.

As long ago as 1881 Kostyčev recommended a decrease in row spacing to 7.5 cm. After 1936 in USSR, interest in narrowing the space between rows affected the construction of sowing implements. The following machine types, used in test sowings, are described: T-8-2 (15 cm. row width) used as a standard; UTS-1 (7 cm. row width); and SB-48 (6 to 8 cm. row width).

A sample of the type of information recorded is given in the table which refers to an experiment made during a dry spring season in the Kirovograd province when the performance of the machine UTS-I was unsatisfactory because of uneven planting.

	Seedlings in 1 sq. m.	Per cent of T-8-2
BARLEY		
T-8-2	269	100
SB-48	241	90
UTS-1 ..	193	72
OATS		
T-8-2	433	100
SB-48	308	71
UTS-1 ..	298	69
WHEAT		
T-8-2	274	100
SB-48	255	93
UTS-1 ..	237	86

The most satisfactory machine is considered to be SB-48 for problems of sowings in narrow rows. —M.H

SEEDS

TIDSKRIFT FÖR LANTMÄN. Lantbruksministeriets beslut om kvalitetsfordringarna för vissa under år 1948 producerade inhemska fröslag. [**Regulations of the Ministry of Agriculture regarding quality requirements for some kinds of seed produced in Finland during 1948.**] *Tidskr. Lantm.* **30.** 107-8. 1948. **974**

For seed of oil flax, fibre flax, poppy, rape and mustard intended for industry the basic price will be paid when purity is 93 per cent and moisture 12 per cent.

For seed of fibre flax, fibre oil flax, vetches, Pelusker peas, swedes and turnips which is suitable for sowing the basic price will be paid when the seed meets the following normal requirements:

	Germination %	Purity %	Moisture maximum %
Commercial seed of fibre flax and fibre oil flax	85	95	12
Vetches and Pelusker peas	87	94	15
Swedes and turnips ..	88	97	10

For seed of flax suitable for sowing to be approved as élite seed the following requirements must be met: germination at least 85 per cent, purity at least 97 per cent; content of weed seeds, maximum 0.5 per cent; seed of other cultivated plants, maximum 0.2 per cent; weight of 1000 seed of fibre flax at least 4.0 grm., of fibre oil flax at least 5.0 grm. and of oil flax at least 6.0 grm.; moisture 10 per cent.

Élite seed should be subjected to field control both in the plots and on the trial grounds of the State Seed Testing Station when its genuineness will be determined: the number of plants of a foreign variety of flax must not exceed one in a hundred. The basic price is increased by 20 per cent for élite seed.—R.P.J.

SVENSK FRÖTIDNING. Ändrade frökontrollbestämmelser. [**Changes in seed testing regulations (in Sweden).**] *Svensk Frötidn.* **17.** 6-7. 1948. **975**

The following changes have been made and will apply from 15 June, 1948, onwards.

The lowest permitted degree of purity in ordinary state sealing of 6-rowed barley and spring wheat is reduced by 1 per cent to 96 and 97 per cent respectively. In addition the compensation between purity and germination, which is permitted for ordinary state sealing in regard to barley and spring wheat, is extended to apply also to state sealing of quality seed.—R.P.J.

NILSSON LEISSNER, G. Ny plomberingsstadga och höjda taxor. [**New sealing regulations and increased fees.**] *Lantm. Svenskt Land* **32.** 254. 1948. [Director, State Central Seed Testing Station, Stockholm] **976**

Fees for tests carried out at the State Seed Testing Station and the local State-aided seed testing stations have remained practically unchanged during the last seven years. During this time costs, particularly salaries, have risen considerably. It has been decided to raise the fees and also to make certain changes in sealing regulations.—R.P.J.

COPENHAGEN, The Danish Seed Growing Company and Agricultural Seed Office. **Trifolium. 1872-1947.** 1947. pp. 19. [English version] pp. 43. [Danish version] **977**

An account of the development and activities of the Danish Seed Growing Company and Agricultural Seed Office and of the far-sighted men who both figuratively and literally sowed the first seed from which a world known firm has grown in 75 years.—P.M.

OTTAWA, CANADIAN SEED GROWERS' ASSOCIATION. Circ. No. 6. **Regulations for the production of registered seed.** 1948. pp. 36. **978**

This revised edition supersedes all previous ones. General regulations applicable to all crops eligibile for registration are given, as well as specific regulations for small grains and miscellaneous crops, grasses and small-seeded legumes, corn (open-pollinated and hybrid), field roots, tobacco and vegetables. By-laws of the Canadian Seed Growers Association are included.—P.M.

SHUEL, R. W. **Seed germinability tests with 2,3,5-triphenil tetrazolium chloride.** *Sci. Agric.* **28.** 34-8. 1943. [Dept. Field Husb., Ontario Agric. Coll., Guelph, Ont.] **979**

The test is based on the colour change resulting from the reaction of the tetrazolium salt, in aqueous solution, with the tissue of the living embryo of the seed. The object of the tests was to develop a quick method requiring a minimum of equipment. Pre-treatment was dispensed with. The tests were used with several varieties of wheat, oats and barley. The seeds were placed in Petri dishes and covered with a 1 per cent aqueous solution of 2,3,5 tetrazolium chloride and were kept at a temperature of 45°C. for five hours. With new seeds this test gives a quick, reliable index of germinability. The test is much less accurate for old seeds whose viability is likely to be less than 60 per cent.—P.M.

BRINK, R. A., and COOPER, D. C. **The endosperm in seed development** (concluded). *Bot. Rev.* **13.** 479-541. 1947. [Univ. Wisconsin] **980**

The second part of this review considers more particularly the failure of seed development. The ideas advanced to explain the occurrence of shrunken and aborted seeds fall into two classes, genetic relations and developmental conditions. As regards the latter, Gramineae are given separate consideration because of the widespread occurrence of irregular mitotic behaviour following species crosses. The remaining aspects of the subject discussed are the relation of seed abortion to the phenomena of xenia and metaxenia, hybrid vigour in the maize endosperm, endosperm mosaics in maize, double fertilization and polyploidy, unreduced parthenogenesis, reduced parthenogenesis and apogamety and cultivation of excised embryos in vitro. [See *Herb. Abstr.* 18, *Abs.* 502.]—D.B.

LAMBOU, M. G., CONDON, M.Z., JENSEN, E., ANDREWS, F. R., and ALTSCHUL, A. M. **A rapid method for the measurement of the inhibition of deterioration in intact seeds.** *Plant Physiol.* **23.** 84-97. 1948. [Southern Reg. Res. Lab., New Orleans, La.] **981**

A rapid method for the measurement of the inhibition of biological activity in intact seeds has been described and applied in investigating the effects of ethylene chlorhydrin and vinyl propionate on heating and lipolysis in flaxseed. A reference standard has been established which makes it possible to assign an inhibitor index to any chemical investigated. The utility of the index has been demonstrated in the case of vinyl propionate. Fundamental and practical aspects of the application of the method are discussed.—Authors' summary.

DISEASES AND PESTS

JARY, S. G. **Insect pests of flax and linseed.** *Farming* **2.** 101-4. 1948. **982**

On the basis of the severity of damage they cause, the insect pests of flax and linseed can be divided into two categories (1) Major pests: Leatherjackets and Flea Beetles; (2) Minor pests: Flax Tortrix Moth, Silver Y Moth, Wireworms and Capsid Bugs. Though its status in this country is by no means well-established at present, the Flax Thrips should also be mentioned. The life history, symptoms of attack and control measures are described for each pest.—G.M.H.

DOEKSEN, J. Het ritnaaldenprobleem in Nederland. [**The wireworm problem in the Netherlands.**] *Maandbl. LandbVoorlDnst* **5.** 105-11. 1948. [Cent. Inst. Landbouwk. Onderzoek, Wageningen] **983**

A short exposition is presented of the biology of *Agriotes* spp., together with a discussion of the conditions leading to serious infestation and means of control. Since some crops (maize, beet) are more susceptible to injury than others (peas, flax), the desirability of being able to determine the wireworm population of the soil before ploughing up grassland or clover fields and sowing to crops is evident. Different methods of making this determination (hand sorting, sieving, washing out) are compared. Any measures for control must take into account also the other soil fauna.—G.M.R.

MORWOOD, R. B. **Control of field crop diseases.** *Qd. agric. J.* **66.** 20-3. 1948. **984**

Seed treatment is the most widely used direct disease control measure in field crops, but the reduction of disease following crop rotation is by no means unimportant. Crop rotation is desirable for the control of cob root and the reduction of smut in maize and it is thought that good rotational practices might also keep root rot in wheat under control in the one area on the Darling Downs, where this disease appears to have been increasing during the last few years. Rotation to maize or other annual crops is also quite beneficial to groundnuts but to get the best results a few years under grass is necessary. In the control of crown rot in groundnuts the accumulation of humus in the soil is more important than the elimination of diseased peanut material.—G.M.H.

KULASH, W. M. **Soil treatment for wireworms and cutworms.** *J. econ. Entomol.* **40.** 851-4. 1947. [N. Carolina St. Coll., Raleigh] **985**

Wireworms and cutworms have done serious damage to row crops in the Wilmington, North Carolina area. A DDT sand mixture of 5 per cent DDT was applied in a narrow strip on either side of seedling corn at a rate of 500 lb. per acre. It afforded protection from the smaller stages of the cutworm, but was ineffective against the older forms of both cutworm and wireworm. In a preliminary test using liquid and dust forms of DDT and benzene hexachloride, it was found that the dust was safer to use than the liquid. When heavy applications of DDT and benzene hexachloride were made, either in dust or liquid suspension, seed germination was retarded.—P.M.

ALLEN, T. C. **Suppression of insect damage by means of plant hormones.** *J. econ. Entomol.* **40.** 814-7. 1947. [Univ. Wisconsin, Madison] **986**

Plant growth regulating substances may be a new tool in the hands of the entomologist in explaining the nature of toxin activity following insect feeding. Such substances will in some instances produce growth changes in plants similar to that caused by insects. They show a close resemblance in enzymatic activity where it is involved and they will inhibit the development of abscission caused by *Lygus*. Certain insecticides, particularly DDT, may also possess a hormone-like effect. A knowledge of the fundamental basis of action of plant hormones and insects should prove very useful in the future if chemicals become available that would possess insecticidal activity as well as properties for inducing growth changes in plants and would suppress certain insect damage.—Author's conclusion.

WEEDS

BLACKMAN, G. E., and HOLLY, K. **Weed control in linseed and flax.** *J. Minist. Agric.* **54.** 538-42. 1948. [Dept. Agric. Univ. of Oxford] **987**

The weed problem in linseed is different from that in flax in that some herbicides in no way interfere with seed production but may still cause loss in fibre production. Nevertheless sulphuric acid is quite unsuitable for linseed and flax. Neither the ammonium salt nor a DNOC suspension of the dinitro-ortho-cresol (DNOC) type of herbicide should be used; the risk does not apply to the sodium salt so long as it is not activated with ammonium sulphate, no wetting agent is added, and the recommendations given in the article are followed precisely. A table gives recommendations for type of compound and maximum permissible concentration for each crop.—G.M.H.

ÅSLANDER, A. Kloratmetodens teknik. [**Technique of the chlorate method.**] *Lantm. Svenskt Land* **32.** 149-42. 1948. **988**

For successful control of weeds by means of sodium chlorate, directions given for its use should be closely followed. On the basis of data in Table 1, the spreading of 200 kg. chlorate per ha. on stubble fields as early as possible is recommended.

TABLE 1.—*Yield of white mustard in kg. per ha. in* 1947 *following chlorate treatment in the autumn of* 1946.

		Säbyholm		Örtofta	
		On stubble	On ploughed land	On stubble	On ploughed land
Klorex spread 13/9, kg. per ha.	0	1550	1970	1280	1340
	200	1780	1200	1200	1140
	300	1330	770	890	810
	400	1410	630	870	740
Klorex spread 3/10, kg. per ha.	0	2130	1790	1200	1300
	200	1650	1000	810	630
	300	1210	680	680	520
	400	1110	640	540	400

Table 2 shows that the chlorate treatment has caused a considerable increase in yield. This can be explained by the fact that by early application of chlorate the large root mass of *Triticum repens* is rapidly killed without impairing the activity of the soil bacteria, and the plant nutrients released on decomposition of the roots benefit the subsequent crop.

ABLE 2.—*Yield of cereal crops in kg. per ha. in the autumn of 1947 following chlorate treatment on ley in the latter part of the summer in 1946.*

		Fjällebro		Rävsal	
		Grain	Straw	Grain	Straw
Klorex					
pread	0	1940	4300	1880	2000
5/7,	200	3350	4000	2810	2600
g. per	300	3280	4220	2000	1900
a.	400	2470	3160	1690	1600
Klorex					
pread	0	—	4500	2060	2470
6/8,	200	3160	4650	2500	2660
g. per	300	2840	4180	2380	2560
a.	400	2500	3750	1900	2160

R.P.J.

ÅBERG, E., and DENWARD, T. Hormonderivatens verkan på ogräs och kulturväxter. [**The effect of hormone derivatives on weeds and cultivated plants.**] *Svensk Jordbr. Forskn. Årsbok* 1947. 65-76. 1947. **989**

Reference is made to work with hormone derivatives conducted by earlier investigators (Boysen-Jensen, Went, Kögl, Haagen-Smit and Erxleben), and to results obtained in recent years by Slade, Templeman and Sexton, von Hofsten, Mitchell, Hamner, Turkey, Åberg and Denward. Plants sprayed with a hormone derivative (unlike those treated for example with sulphuric acid) do not die immediately, but only after some days have elapsed, in some cases after a week or even a month.—R.P.J.

KONING, H. Kalkstikstof als onkruidbestrijdingsmiddel. **Weed control by calcium cyanamide.** *LandbVoorlDnst. Med.* No. 56. 1948. pp. 50. pls. [English summary, pp. 42-5.] [Information Service, Min. Agric., Netherlands] **990**

This comprehensive review of the literature (140 references) is designed to be of assistance to the Netherlands farmer, and summarizes a large amount of information on the action of calcium cyanamide upon weeds, method and time of application, weather conditions favourable to success, quantities, technique and effects in the case of the various crop plants.—G.M.R.

CAYOUETTE, R. La sensibilité des plantes à l'action de l'herbicide 2,4-D [**The susceptibility of plants to the action of the herbicide 2,4-D.**] *Agriculture* **4.** 331-40. 1947. **991**

The relative susceptibility of plants to the action of the herbicide 2,4-D is examined and cultivated plants and weeds of interest in agriculture in the Quebec area are accordingly classified as susceptible, moderately susceptible and resistant. Instructions and advice on the use of this herbicide are also given.—E.B.

ДЕРЕВИЦКИЙ, Н. Ф. О заглушении сорняков. *Совет. Агрон.* 1947. *No.* 4. стр. 61-3.

DEREVICKIĬ, N. F. [**Suppression of weeds.**] *Sovet. Agron.* 1947. No. 4. pp. 61-3. **992**

A fundamental rule for weed suppression, (as distinct from exterminating or preventing measures) is that the most suitable conditions for crop plants should be created to secure establishment at the expense of weed competition, and to give high yields. Cultural measures which ensure these conditions for winter and spring sowings are discussed. For early establishment of spring crops, soaking seeds is recommended, as this results in seedlings emerging 3 days earlier than normal.

No special experiments on the system of suppression have been made, but observations of kolhoz and sovhoz sowings and in plots of experimental institutions of the Voronež and Uljanovsk regions show that suppression is both practicable and applicable for long-term studies.—M.H.

NORMAN, A. G. **Agronomic uses for plant growth-regulators.** *J. Amer. Soc. Agron.* **40.** 111-9. 1948. [Camp Detrick, Frederick, Md.] **993**

In this paper presented at a general session of the Society in Cincinnatti in November, 1947, some new uses for the plant growth-regulating substances or inhibitors are described. In the case of weed eradication the substances cannot be expected wholly to replace cultivation, but if used as an aid to cultural methods, they may greatly reduce both weed competition and labour costs. Few of the compounds worked with at present exhibit any definite species selectivity. The fact that 2,4-D kills broad leaved plants and does not harm grasses or cereals is only apparent selectivity, as higher concentrates of 2,4-D injure or even kill grass sod and reduce the yield of small grains.

The observation that the overall sensitivity of plants decreases with increasing age and also with the age of the plant part tested, may well form a basis for some agronomic uses. Young weeds could probably be killed by spray treatment at a rate which would not kill the older crop plant: young broadleaved weeds in a cereal crop can be killed or inhibited by treatments that do not injure the older cereal crops. This principle has been used successfully in removing weeds from barley and rice fields in California and from wheat in the Red River Valley by aircraft spraying with 2,4-D. This practice also provides for weed control at a time when no cultural operations can be performed.

Possibly the greatest agronomic developments in weed control lie in direct soil application. Seed germination in contact with low concentrations of 2,4-D may be completely prevented and if a sufficient concentration of a growth regulator could be built up in the shallow zone near the surface in which germination takes place, the appearance of weeds would be much deferred: this could be done by seed bed pre-treatment, seed bed treatment, pre-emergence treatment and post-emergence treatment. The effectiveness and desirability of the soil treatments will depend on prevailing weather as well as on the growth-regulator selected. [See *Herb. Abstr.* 18 *Abs.* 759.]—P.M.

Oklahoma Agricultural Experiment Station. Circ. No. C-128. **Chemical control of weeds in Oklahoma for 1948.** By *W. C. Elder* and *F. A. Romshe.* 1948. pp. 15. **994**

The circular is in two sections : Weeds in field crops and weeds in horticultural crops. Recommendations for the use of 2,4-D, sodium chlorate and " Atlacide," borax and ammonium sulfamate (" ammate "), are given in the first section. The remarkable selectivity of 2,4-D is valuable because many weeds can be killed in growing crops. Weeds must be growing actively to obtain maximum results ; the chemical is not as effective in dry weather when plants are somewhat dormant. Annual weeds should be sprayed when young or in the seedling stage ; perennial weeds are most susceptible to 2,4-D when in the bud stage or just prior to blooming. The chemical can be used profitably on winter wheat only when weed infestation is heavy enough to warrant taking some loss in yield of wheat, or when stands are so thin or late in maturing that they may allow weeds to develop enough to interfere with combining. In treatment of spring oats and barley, the crops should be treated after starting but not in the bloom stage. The best time to apply 2,4-D in corn and sorghum crops is when cultivation is impossible because of wet soils, or when susceptible weeds escape cultivation in the row.

Bindweed is the major weed problem in wheat fields in the State. It cannot be eradicated by the first application of 2,4-D. Proper application will kill a large percentage. Optimum results have been obtained from autumn applications, made after rains when the vines were growing rapidly. Spraying of bindweed in May, before it starts blooming, also produces good results.

Sodium chlorate is recommended for use on small areas of deep rooted persistent weeds. " Atlacide " is normally used for spraying as it is less inflammable. In the State, best results have been obtained by applying 4 lb. of dry powder of sodium chlorate per sq. rod. Borax is recommended for killing vegetation on non-agricultural land. Ammonium sulfamate is best used as a foliage spray (1 lb. per gallon) on woody shrubs. It has given good results against poison ivy but has been too expensive for use on large areas.—P.M.

Bakke, A. L., and Sylwester, E. P. **As we fight weeds in '48.** *Iowa Fm Sci.* **2.** 7-8. 1948. **995**

A popular account of some of the chemical weed killers and instructions regarding their use. The chemical 2,4-D is dealt with at some length and suggestions are given for spraying crops of corn sorghums, oats, spring wheat, barley, winter wheat, flax and grasses. Other chemical weed killers referred to are sodium chlorate and Atlacide, Sinox, Dow Selective, Borax, Ammate, IPC and Cyanamid.—P.M.

Taylor, D. L. **Effects of 2,4-dichlorophenoxyacetic acid on gas exchange of wheat and mustard seedlings.** *Bot. Gaz.* **109.** 162-76. 1947. [Hull Bot. Lab., Univ. Chicago] **996**

Seedlings of *Triticum vulgare* and *Brassica alba* were investigated at different stages of development. Respiration as measured by oxygen uptake and evolution of carbon dioxide, was reduced by treatment with 2,4-D and in proportion to the concentration of growth regulator. The responses appeared more irregularly and less distinctly for mustard than for wheat and more frequently in earlier stages of development of seedlings. The responses are discussed in relation to the action of 2,4-D as a herbicide.—D.B.

CEREALS

Daus, F. A. Extensión de la zona cereal argentina. [**Extent of the Argentine cereal zone.**] *Gaea* **7.** 377-82. 1945. [Received 1947.] **997**

The Argentine region naturally and economically suitable for the cultivation of cereals (excluding rice) and linseed constitutes a continuous and coherent whole, situated largely in the humid pampa and coinciding with the isohyet 500 mm. and the presence of the black earths or tshernosems, ceasing at the brown earths of the Argentine *monte.* The region is mapped. It comprises approximately 66 million ha. from which a small area of unsuitable land such as lakes and saline deposits must be deducted.—G.M.R.

Niles, J. J. **Paddy cultivation in the Jaffna peninsula.** *Trop. Agriculturist* **102.** 226-31. 1946. **998**

The cultivation of paddy (*Oryza sativa*) in the Jaffna Peninsula of Ceylon differs from that in the rest of the island. It is rain-fed, the rain that collects in the " bunded " fields and the low-lying lands being the source of water supply. Dry sowing is carried out, in fields which have been ploughed and prepared earlier, with the break of the north-east monsoon in September. Success depends on the amount and distribution of rainfall. The many varieties of paddy cultivated on the peninsula are listed and notes are given on manuring, cultivation, seed, harvesting, threshing, drying and storage. Average yield varies from 20 to 25 bushels.—G.M.H.

HERRIOT, R. I. **Rye.** *J. Dept. Agric. S. Aust.* **51.** 319-26. 1948. [Soil Conservator] **999**

The place of rye (*Secale cereale*) in world agriculture and its special botanical features are reviewed. In South Australia the crop, which in 1945-46 occupied 52,000 acres, is used primarily for the control of soil erosion in low rainfall areas and for early greenfeed. Although it is the most resistant of all cereals in the early stages of growth rye can only withstand a small amount of sand blasting. Seeding operations for sand drift control are therefore designed to reduce this hazard to a minimum and are summarized as follows : (1) Sow early, and only in wet soil ; (2) use a combine with cultivating tynes removed ; (3) use 40 lb. of seed and at least 56 lb. superphosphate per acre and (4) fit to the machine new shares of largest fitting before commencing seeding. It is not advisable to sow dry or use harrows.—G.M.H.

FISHER, J. R. **The wheat industry and wheat research in New Zealand.** *J. Aust. Inst. Agric. Sci.* **13.** 169-71. [Cereal Chemist, N.S.W. Dept. Agric.] **1000**

Wheat growing in New Zealand is largely confined to the South Island, chiefly in the eastern regions of the Province of Canterbury. Production has averaged 7.3 million bu. per annum over the last decade, but home consumption requirements at present are 12.5 million bu. Average yield is 33 bu. per acre compared with 11.5 bu. in Australia. Rotations adopted usually consist of sown pasture for not less than three years (during which time financial returns may be obtained from grazing, pasture hay or grass and clover seed), followed by a crop such as rape, peas or turnips, grown to improve the physical condition of the soil for the following year's wheat crop. The acreage sown to wheat tends to follow inversely prices received for fat lambs, grass and clover seed, and yields of wheat per acre tend to be positively correlated with increased use of agricultural land for grazing purposes.

Seed certification schemes are provided by the Department of Agriculture for most agricultural seeds, including cereals, grasses and clovers. Three grades of certified seeds are recognized : (1) Certified Pedigree Seed, (2) Certified Mother Seed, (3) Certified Standard Seed.—G.M.H.

MENDES, C. T. O problema do trigo. [**The wheat problem.**] *Rev. Agric., Piracicaba* **23.** 1-11. 1948. [Prof., " Luiz de Queiroz " Agric. Coll., Univ. São Paulo, Brazil] **1001**

The consumption and with it imports of wheat have been increasing in Brazil in recent years to an extent which constitutes a serious economic problem. The country must either produce a " national bread " from the cereals more easily grown there, or grow much more wheat. Wheat can seldom be successfully grown nearer the Equator than 30° south or north. This and other limitations of wheat-growing are discussed in relation to Argentina, Uruguay, Australia (and even here conditions are not favourable or easy for the cultivator), north Africa and India. India forms a remarkable exception to the abovenamed rule, for wheat is successfully grown at latitudes approximating 25°, largely owing to the work of the Pusa Experiment Station. The Brazilian regions in which wheat-growing might be extended are surveyed, and proposals are made for a great intensification of research and breeding, the work of Boerger at La Estanzuela in Uruguay and of Iwar Beckman in the south of Brazil having already shown what invaluable help can be given by the breeder.—G.M.R.

UNDERWOOD, E. J., and MILLINGTON, A. J. **Further studies with cereal hays in W.A.** *J. Dept. Agric. W. Aust.* **24.** 249-59. 1947. [Inst. of Agric. Univ. W. Australia and Dept. Agric. Perth, W. Australia] **1002**

[See *Herb. Abstr.* 18, No. 5.]

UPPSALA, Jordbrukstekniska Föreningen. Medd. No. 91. Täckning av sädesskylar med pappershattar. [**Covering corn shocks with paper " hats ".**] By *Y. Andersson* and *H. Lönnemark.* 1944. pp. 26. [Received 1948.] **1003**

Trials have shown that paper hats protect the crop better than hats made of sheaves turned inside out. The provision of such protection is remunerative only when weather conditions are particularly unfavourable during the whole period of field drying. Covering of autumn wheat with paper hats may be economic, but is not generally so. Autumn rye is the only cereal for which the use of paper hats can with any certainty be considered to be economic.—R.P.J.

HAMNER, C. L., TUKEY, H. B., and CARLSON, R. F. **Application of 2, 4-Dichlorophenoxyacetic acid to soil as a pre-emergence spray to prevent lodging and to control weeds in sweet corn.** *Quart. Bull. Mich. agric. Exp. Sta.* **30.** 194-200. 1947. [Sect. of Hort., Mich. Sta. Coll.] **1004**

Corn was planted on June 25 and July 25 in rows 3 feet apart, drilled about 2 in. into the soil. Immediately after planting, a 70 per cent preparation of sodium salt of 2, 4-D was applied to the soil surface, as a spray at rates of 5, 10 and 20 lb. per acre. Very effective control of weeds was obtained with all three concentrations. The most marked effect of the treatment was an increased development of brace roots forming a strong feeding-root system and frequently filling the soil adjacent to the plant with a sod-like mat. The combination of increased number of tiers of brace roots and the firm anchorage by penetration and branching prevented lodging.

The application of 5 pounds per acre of DDT, applied to warm moist soil made it possible to grow the corn to maturity without further cultivation. Observations here reported suggest a chemical approach to the elimination of corn cultivation.—P.M.

КОЖУХОВ, И. В. О теоретических основах агротехники кукурузы. *Совет. Агрон.* 1947. *No.* 4. стр. 6-26.

Kožuhov, I. V. [**Theoretical principles on the cultivation of maize.**] *Sovet. Agron.* 1947. No. 4. pp. 6-26. **1005**

Because dryness is the primary factor limiting yields of maize in USSR, great importance is attached to type of drought, as well as to the extent and time of onset of the dry period, in working out agrotechnical measures for maize production. Opinion in the literature (cited, but references are omitted) is not unanimous regarding the effect of atmospheric drought on maize, but there are no conflicting opinions regarding the adverse effect of soil dryness during the critical period of maize growth (that is, for a week before tasselling) when there is intensive accumulation of dry substance and high consumption of water.

This paper includes information on (1) climatic and soil conditions in different years and for various regions of maize cultivation in USSR ; (2) yields obtained from the Kuban, Rostov and Bezenčuk experiment stations during years ranging between 1915 and 1945 ; (3) the root system of the variety Minnesota 13 ekstra ; and (4) agrotechnical measures, with special reference to mechanization of sowings.—M.H.

Bangham, W. N. Hule y maíz. Una excelente combinación para los trópicos americanos. [**Rubber and maize. An excellent combination for tropical America.**] Trans. by *H. E. Yglesias*. *3a Conf. Interamer. Agric. Caracas*, 1946. pp. 21. [Research Dept., Goodyear Rubber Plantations Co., Cairo, Costa Rica] **1006**

Of the different food plants, rice, beans including soybeans, groundnuts, maize, tested for intercropping with *Hevea*, maize proved most successful in the Goodyear Plantations region of Costa Rica, where conditions are tropical, there are no well-defined seasons and the mean annual rainfall of 150 ins. is evenly distributed throughout the year. The effect of intercropping on the rubber has been entirely good, but difficulties have been encountered in producing economic and adequate crops of maize. Satisfactory methods of mechanical cultivation and of drying have been evolved, but attempts to vary the restricted sowing seasons current in the region (February to March and August to September) resulted in failure which is attributed almost exclusively to insect attack. An account is given of research in progress, which is concerned in the main with selection and hybridization for varieties which shall be productive and adapted to the local conditions. Insect pests constitute a serious obstacle to the work, and of controls hitherto tried, DDT has been the most efficient.—G.M.R.

Arkansas Agricultural Experiment Station. Bull. 465. **The effect of common salt on rice production.** By *L. C. Kapp*. 1947. pp. 7. **1007**

Common salt occurs in well water supplies along the Arkansas River in sufficient quantities to injure crops. In greenhouse experiments, the addition of 5700 parts per million of sodium chloride to rice soil prevented grain formation and reduced seed germination. There was only a slight reduction in straw production. In the field there was a reduction in yields when salt was applied before seeding ; this was mainly due to decreased seed germination. The same application to rice seedlings before the first watering did not significantly decrease the rice grain yield. Results show that 825 lb. of salt per acre added to the soil surface before seeding hinders germination ; 3300 lb. added before the first watering reduces the grain yields. The source and chemical composition of irrigation water used for rice production should be considered from the standpoint of its immediate and long-term effects.—P.M.

Arkansas, Agricultural Experiment Station. Bull. 467. **The effect of controlling weeds by irrigation and seeding practices on rice yields.** By *L. C. Kapp* and *R. P. Bartholomew*. 1947. pp. 7. **1008**

Studies were carried on at the Rice Branch Experiment Station from 1941 to 1944. Results indicate that plots carrying a small number of weeds gave greater rice yields than plots in which weeds were numerous. In experiments not correlated with weediness, higher yields of rice were obtained when the cultural practice used required the rice seedlings to sprout through either soil or water rather than through both. Germination and vitality of rice plants may be lowered when water is withdrawn as soon as the seeds sprout and the plants are left dying on the surface of the soil. It is suggested that vitality is lowered when the rice is seeded on water collected for six months over worked soil, which has become packed. Cultural and irrigation methods which prepare a good seedbed and control weeds, result in higher rice yields. —P.M.

Camargo, J. B. A irrigação como fator importante para a solução da cultura do trigo no Estado de São Paulo. [**Irrigation as an important factor in solving the wheat-growing problem of São Paulo.**] *Rev. Agric., Piracicaba*

23. 95-102. 1948. ["Luiz de Queiroz" Agric. Coll., Univ. São Paulo, Brazil] **1009**

Experience at the Campinas Agricultural Experiment Station has shown that deficient rainfall is one of the principal obstacles to wheat-growing in the Brazilian State of São Paulo. Experiments in the irrigation of this culture are in progress at the Luiz de Queiroz Agricultural College, five different treatments being applied to sowings made at 2-weekly intervals from the 1st March onwards. As rainfall in 1948 is abundant, there may not be any great difference between results in the treated and untreated plots, unless there is a lack of rain at the critical, earing phase. In another area a trial of irrigation by inundation is being made.—G.M.R.

ARKANSAS, Agricultural Experiment Station. Rep. Ser. No. 6. **1946 Arkansas corn yield tests.** By *D. B. Shank* and *B. D. McCollum*. 1947. pp. 23. [Received 1948.] **1010**

Tabulated data is presented in respect of yield, stand percentage, lodging resistance, shelling percentage and tip cover. In general, the tests support conclusions arrived at in previous years, that (1) many hybrids are superior to open-pollinated varieties ; (2) not all hybrids are better than all varieties ; (3) hybrids well adapted to one region of the state may not be well adapted to another region ; (4) high yielding hybrids may have other faults that make them undesirable. In 1945, it was thought that more good white hybrids were becoming available than yellow. The 1946 tests do not substantiate this. With one exception (M.P. 5111) the hybrids producing the highest yield in 1946, were yellow. At one station fairly high yields were produced by irrigation, and results indicated that when varieties had sufficient moisture they compared more favourably with hybrids in yield. Hybrids seem able to withstand unfavourable weather conditions much better than do varieties. —P.M.

ILLINOIS Agricultural Experiment Station. Bull. 521. **1946. Illinois hybrid corn tests.** By *G. H. Dungan, J. H. Bigger, A. L. Lang, B. Koehler* and *R. W. Jugenheimer*. 1947. 341-70. **1011**

Data are given concerning the tests made on 266 hybrids grown on 6 regular test fields, and 6 single-cross and 5 double-cross hybrids grown on 2 special test fields differing in productivity. The bulletin includes pedigrees of Experiment Station and U. S. hybrids whose performances are shown. —P.M.

ILLINOIS Agricultural Experiment Station. Bull. 527. **1947 Illinois hybrid corn tests.** By *J. F. Rundguist, G. H. Dungan, J. H. Bigger, A. L. Lang, B. Koehler* and *R. W. Jugenheimer*. 1948. 523-58. **1012**

Tests were conducted on 295 hybrids ; as in 1946-6 single, cross and 3 double-cross hybrids were grown on 2 fields differing in productivity. Detailed results of all tests are given in tabulated form, each table including a summary of 3 years results, thereby giving a reasonably reliable picture of the hybrid's ability to perform under varying seasonal conditions.—P.M.

ILLINOIS Agricultural Experiment Station. Bull. 523. **Two new Illinois inbred lines of corn.** By *R. W. Jugenheimer. E. R. Leng*, and *C. M. Woodworth*. 1947. 393-400. **1013**

In March, 1947, Illinois Agricultural Experiment Station released two new mid-season yellow inbred lines of corn, R 59 and R 61. The former is from a cross of Iowa L317 × Illinois Low Ear backcrossed once to L317. It silks earlier than L317, is short and more resistant to scrub and the ears are lower. R59 hybrids would appear to be superior to L317 hybrids in yield ; although they silk earlier than the hybrids of L317 the seed contains more moisture at harvest. Performances of 14 hybrids containing inbred R59 are shown.

The inbred R61 was developed from a commercial hybrid which had been crossed with a 4-year selfed line out of Lancaster yellow dent, backcrossed once to the Lancaster line and then selfed until uniform. The performance of ten new Illinois hybrids containing inbred R61 are shown. —P.M.

IOWA Agricultural Experiment Station. Bull. P87. **Iowa corn yield test 1947.** By *J. L. Robinson* and *C. D. Hutchcroft*. 1948. 863-915. [Sec., Iowa Corn and Small Grain Growers' Assoc., Res. Prof. Fm Crops Subsect., Agron. Sect., Iowa Agric. Exp. Sta. (J.L.R.) ; Res. Associate Fm Crops Subsect., Agron. Sect., Iowa Agric. Exp. Sta. (C.D.H.)] **1014**

The purpose of this test was to compare the performance of different hybrids. The state was divided into 4 sections from north to south, each section being further divided into three districts. A total of 81 entries was tested in each section ; each entry was planted in all three districts of a section. The bulletin gives information on yield, stand, moisture, lodging, ear height and dropped ears for each hybrid tested.—P.M.

KANSAS Agricultural Experiment Station. Bull. 336. **Kansas corn tests 1947.** By *A. L. Clapp, L. A. Tatum*, and *W. Vandeventer*. 1948. pp. 39. **1015**

Since 1935, when little more than 1 per cent of the total corn acreage of the State was planted to hybrid corn, there has been a steady increase in the acreage. In 1947, the acreage had increased to 79 per cent. Development of new hybrids by Federal state experimental stations and private breeders has made it necessary to continue an extensive testing programme.

In 1947 tests were similar to those of previous years, the state being divided into 7 districts, based on soil, rainfall, and the length of the growing season. The bulletin gives the 1947 results, together with summaries of the results of tests of the past 6 years. Because the maturity date has great influence on the yield of corn hybrids in Kansas, it is difficult to predict yielding ability of different hybrids. In some of the performance tables, relative maturity is shown by the moisture content of the grain at harvest.—P.M.

North Carolina Agricultural Experiment Station. Bull. No. 361. **Measured crop performance 1947.** By *H. L. Cooke* and *R. P. Moore.* 1948. pp. 47. **1016**

The report of the North Carolina official crop performance tests of 1947. The purpose of the tests was to obtain information on (1) the most satisfactory commercially available varieties or hybrids; (2) which new varieties from the experiment stations or commercial plant breeders may replace varieties or hybrids now in commercial production; (3) the relative merits of commercially available corn hybrids which are required by law to be tested the year preceding the time when they are put on the market. The report gives recommendations, and performance records of varieties of corn, small grains and cotton.—P.M.

Oklahoma Agricultural Experiment Station. Bull. B-317. **Performance tests of corn varieties and hybrids.** By *J. S. Brooks* and *R. A. Chessmore.* 1947. pp. 30. **1017**

The tests were conducted at 7 locations in the corn growing sections of Oklahoma, a total of 100 strains being tested. All strains tested were grown at each station to provide a basis for estimating the adaptation of each strain to conditions within the State. Tables giving the results of the tests, showing rank, strain, yield and percentage of lodged plants, are included.—P.M.

Pennsylvania Agricultural Experiment Station. Bull. 494. **Pennsylvania corn hybrid performance. 1943-46 tests.** By *L. L. Huber*, *B. H. Seem*, *B. F. Coon* and *C. C. Wernham.* 1948. pp. 46. **1018**

The first part of the bulletin deals with (1) choice of adapted hybrids; (2) diseases and insect pests and their control; (3) development of hybrids; (4) use of certified seeds; (5) efficient use of hybrids. Tabulated data of corn hybrid performances are presented in the latter part of the bulletin and for easy reference an index of the hybrids is included. Fifty-two double-cross hybrid tests were conducted between 1943-1946. Hybrids recommended for use in the State (in order of maturity, early to late) are: Wis 275, Wis 335, Wis 412, Ohio M15, Ohio K24, Iowa 4059, Ohio W10, Ohio C88, Ohio C12 and U.S. 13. It is emphasized that environmental factors vary in their intensity from year to year or in different locations during the same year. Hybrids are largely accepted or rejected on the basis of performance over a period of years.—P.M.

Kansas Agricultural Experiment Station. Circ. 242. **Osage and Neosho oats.** By *E. G. Heyne*, *C. O. Johnston*, *E. D. Hansing* and *A. L. Clapp*. 1947. pp. 15. [Received 1948] **1019**

Although Kansas produces about 35,000 bushels of oats annually, production has been hazardous due to the damage caused by rust and smut. Breeding and selection of varieties resistant to rust were started in 1927. In 1945, Osage and Neosho oats were released for commercial production, thereby making varieties resistant to both smut and rust available in Kansas for the first time. Both varieties are resistant to crown and stem rust and to smut. A certain amount of rust may develop, but it is insufficient to damage the crop seriously. Osage has a wider range of adaptability and yields more than Neosho; the yield potential may be attributed to the greater tillering ability of Osage. Neosho has more smut resistance than Osage; on the other hand, Osage has more crown rust resistance and more stem rust resistance than Neosho.

During 1943, '44 and '45, which were severe rust years, both varieties yielded 25 to 100 per cent more grain than older varieties; they were nearly 100 per cent erect when the old varieties lodged.—P.M.

Jones, J. W., Adair, C. R., Jodon, N. E., Beachell, H. M., and Davis, L. L. **Effect of environment and source of seed on yield and other characters in rice.** *J. Amer. Soc. Agron.* **39.** 874-86. 1947. [Div. of Cereal Crops and Diseases, U. S. Dept. Agric.] **1020**

Caloro, Early Prolific and Fortuna varieties of *Oryza sativa* were used in the experiments which were designed to give accurate yield comparisons of the crops grown from seed of the same variety but from different sources. Yield data are tabulated for the different varieties grown at four stations in Arkansas, Louisiana, Texas and California over a period of 5 years. Among the measurements made were the average test weight of each variety, germination percentage, grain and kernel weight, percentages of hulls, whole kernels and broken rice and the yield per acre. Local seed of good weed-free quality proved as productive as that obtained from other rice-producing states and the seed germination at different stations was essentially the same for each source of seed. Differences in average grain and kernel weights within each variety were comparatively small for all stations. Milling quality varied widely between years, varieties and locations but the milling quality of the grain was unaffected by source of seed.—M.E.E.

THOMAS, I., SAMUEL, L. W., and MILLINGTON, A. J. **Wheat variety trials on research stations.** *J. Dept. Agric. W. Aust.* **24.** 30-42. 1947. **1021**

New rust resistant varieties and cross-bred types of *Triticum vulgare* from other States were compared with the standard Bencubbin and Bungulla varieties of Western Australia. Seasonal conditions were such that rust damage was widespread after heavy summer rains. Experimental data are given for the Merredin, Avondale, Chapman, Salmon Gums and Wongan Hills research stations and particular importance is attached to flour strength, yield and disease resistance. New varieties tested were Frisco, Yalta, Gabo and Kendee, all of which promised to be useful rust-resistant types for Western Australia.—M.E.E

THOMAS, I. **New cereal varieties in Western Australia.** *J. Dept. Agric. W. Aust.* **24.** 341. 1947. **1022**

Details are given of one wheat variety (Diadem) and one oat variety (Orient) which were submitted for registration by the Victoria Department of Agriculture in 1947. Diadem originating from a cross between Ghurka and White Fife possesses a moderate resistance to flag smut but is susceptible to rust. Its main outstanding ability is its prolificacy. Orient is the result of a cross between Palestine and Dawn. It has been selected mainly as a grazing oat, which, in late season grazing, returns higher yields of greenstuff than Dawn or Algeribee, Orient is not recommended as a May variety for sowing on non-fallowed land.—G.M.H.

MCKEON, B. F. **Cereal investigations in the Wimmera.** *J. Dept. Agric. Vict.* **46.** 73-81. 1948. **1023**

The investigations in progress at Wimmera are described and the various results discussed. The prominent wheats in the tests are Pinnacle, Quadrat, Diadem, Ghurka, Magnet and Baldmin. Pinnacle is a midseason variety, highly resistant to flag smut disease and possessing good harvesting characteristics and is recommended as a suitable variety for the Wimmera plains. Its average yield in trials for 5 seasons has been 30.5 bu. per acre, compared with Quadrat 29.1, Magnet 28.5 and Ghurka 26.4 bu. per acre. The characteristics of each of the other wheat varieties are also given.

The following points of interest arise from time and rate of seeding tests with wheat : (a) it is desirable to sow as soon as possible after the middle of May consistent with clean crops being obtained ; (b) when sown early, only small differences in yield are obtained over the range of seeding rates from 45 to 120 lb. per acre, but 60 to 70 lb. is considered the most suitable quantity to use ; (c) as the time of seeding becomes later the rate of seeding may profitably be increased, though not above 90 lb. per acre.

Reviewing the wheat grazing trial which was commenced in 1936 to determine the effect on yield of grazing the wheat crop with sheep in late winter and to compare the different varieties under grazed and ungrazed conditions it is noted that in the four years, 1936, 1937, 1939 and 1941 there was a decrease in yield with each variety tested due to grazing. In the dry seasons 1938 and 1940 however, the grazed plots generally retained a higher yield, particularly in 1940 when the increase was very marked with each variety.—G.M.H.

WASHINGTON Agricultural Experiment Station. Bull. No. 485. **Marfed wheat.** By *O. A. Vogel, S. P. Swenson, H. D. Jacquot* and *C. S. Holton.* 1947. pp. 8. **1024**

As a result of crossing Marquis-Florence and Federation wheats, this new variety of soft white spring wheat has been developed. Marfed was increased for release and distribution to seed growers in 1946 and has proved better adapted to eastern Washington than the Federation variety. Yield data are given for numerous trial localities over a 7-year period, and it appears that Marfed is equal to Federation wheat in height, resistance to lodging and shattering and time of seeding both in spring and autumn. The milling quality of Marfed is somewhat variable but it has moderate disease resistance and good winter hardiness.—M.E.E.

UPPSALA, Swedish Institute of Agricultural Engineering. Medd. No. 211. Torkning av skördetröskad spannmål. [**Drying of combined grains.**] By *T. Lundström.* 1947. pp. 31. **1025**

In Sweden, the water content of combined grain varies between 18 and 35 per cent and in order to be fit for storage the grain has to be artificially dried. Of the hot-air driers in common use, those of the silo types are frequently used at individual farms. The drying is done by hot air circulating through the grain as it moves slowly down through the silo. Details are given of the working and output of this type of drier. Tests have shown that germinating power is not reduced by drying, but the grain can often be injured during storage because it is often 10°C. higher than the surrounding air at the output end. The grain must therefore be aired once or twice at the beginning of storage in order to hurry the cureing. Data is given concerning the cost and the running costs of the drying plant.—P.M.

SPRENGER, J. J. I. Graandrogen en graandrogers. [**Grain drying and grain driers.**] *LandbVoorlDnst Med.* No. 55. 1948. pp. 112. [Cent. Inst. Landbouwk. Onderzoek, Wageningen] **1026**

This brochure outlines the work of the Netherlands Grain Drying Commission since its establishment in 1941, discusses the principles, history and economics of grain drying, and gives a short description, illustrated by drawings, of a large number of different driers.—G.M.R.

Nunn, W. M. **A simple method of handling feed wheat in bulk.** *J. Dept. Agric. W. Aust.* **24.** 63-7. 1947. **1027**

A description is given of a bin and hoisting gear suitable for handling large quantities of wheat in bulk which is now required by farmers in the Wheat Belt of Western Australia. The bin consists of a corrugated galvanised iron tank fitted with two sliding doors near the bottom and a manhole for receiving the wheat at the top. A hoisting frame and wheat bucket enables the bags of grain to be emptied into the tank for storage. Cost of installation would amount to about £30 and the outfit would have a capacity of 10 tons. There are two scale diagrams showing details of construction.—M.E.E.

Åkerman, Å., Lindberg, J. E., and Augustin, S. Undersökningar av kvaliteten hos 1946 års brödsädesskörd. [**Investigations of quality of the 1946 bread grain harvest.**] *Sverig. Utsädesfören. Tidskr.* **57.** 427-59. 1947. **1028**

The Cereal Laboratory of the Swedish Seed Association has since 1930 conducted investigations of quality of bread grain crops in Sweden, at the request, during the early period, of the Government Grain Board and the Board of Agriculture, and during the last few years of the Food Commission. Recently the Laboratory has also carried out an inventory of quality for the guidance of those concerned with the regulation of bread grain.—R.P.J.

Tordesillas, F. S. Sobre la variabilidad de la composición de las harinas de trigo de " extracción legal ". [**On the variability of composition of wheat flours of "legal extraction".**] *Bol. Inst. Invest. agron.* No. 17. 105-24. 1947. **1029**

On the assumption that the average wheat moisture is 12 per cent, it is possible to obtain " legal extraction " flours corresponding to yields of less than 90 per cent, with reference to clean wheat and correlative yields of bran of over 10 per cent, handling commercial wheats having not over 4.5 per cent impurities. " Legal extraction " flour should have not over 16 per cent moisture ; from 16 to 40 per cent moist gluten ; 6 to 14 per cent dry gluten ; from 1.3 to 1.5 per cent ashes (referred to dry matter) ; less than 0.3 per cent ashes insoluble in 10 per cent hydrochloric acid (referred to dry matter) ; 6 to 9.5 per cent of residue on the metallic sieve No. 120 (45 threads per linear centimeter) gathered in the extraction of gluten ; 1 to 2 per cent cellulose and not over 0.4 per cent acidity expressed in lactic acid and referred to dry matter.—From Author's summary.

Cambridge University, Department of Agriculture, Farm Economics Branch. Rep. No. 33 **An investigation into the costs of wheat growing in 1946.** By *L. Uribe.* pp. 8. [mimeographed 1947. **1030**

This is an account of an investigation into the costs of growing wheat in 1946 on 87 farms in the three districts of West Cambridge, North Essex and East Suffolk (Ipswich). The following is a summary of results :

		£	s.	d.
(a) Average cost per acre :				
West Cambridge (Heavy) ..		14	0	9
North Essex (Heavy)		14	2	7
Ipswich (Light)		13	12	5
(b) Average yields and receipts per acre :		£	s.	d.
West Cambridge (Heavy)	2.5 bu. Corn	17	3	6
North Essex (Heavy)	2.52 bu. Corn	16	15	10
Ipswich (Light) ..	2.16 bu. Corn	14	3	10
(c) Average net profit per acre, including the Wheat Subsidy, but excluding the value of the straw :		£	s.	d.
West Cambridge (Heavy)		5	2	9
North Essex (Heavy)		4	13	3
Ipswich (Light)		2	11	5

—G.M.H.

Canada Department of Agriculture. Publ. No. 790. Tech. Bull. No. 58. **The effects of immaturity and artificial drying upon the quality of seed corn.** By *F. Dimmock.* 1947. pp. 60. **1031**

As a result of this investigation the drying of seed corn by heated air under forced draught, at a temperature 108± 1.5°F., can be recommended as a safe procedure for corn that has reached normal maturity, containing up to 35 per cent of moisture in the kernels at harvest. Such seed when dried in the ear to 14 per cent or slightly lower, suffers no injury to its germination, vitality or productivity and may be shelled and stored safely. Seed dried to as low as 2 per cent of moisture suffers no reduction in germination, but seedling vigour is weakened and emergence retarded by such thorough drying, which is both costly and unnecessary. Artificial drying at 108± 1.5°F. is injurious to immature corn in which the kernel moisture content exceeds 40 per cent at harvest. The effects of the drying process are to lower the percentage germination, retard seedling emergence and reduce seedling vigour. Productivity is reduced as the result of poor stands and inferior plant performance.—From Author's summary.

Casals, C. R. Selección de la semilla de maiz. [**Selection of maize seed.**] *Rev. Agric., Costa Rica* **20.** 134. 1948. **1032**

The Costa Rican farmer is accustomed to select maize for sowing from his granary, selecting the largest cobs and the most developed grains. He should instead select from the growing crop, marking the most vigorous and well-developed plants and in these not necessarily the largest cobs, but those having long stigmas and, subsequently, regularly arranged grains. These cobs should be allowed to dry as far as possible on the plant ; only the grains of the middle part of the cob should be used ; germination tests should precede sowing ; and the vicinity of other, possibly inferior maize cultures, should be avoided.—G.M.R.

Arkansas Agricultural Experiment Station. Rep. Ser. No. 5. **Rice seed treatment.** By *E. M. Cralley*. 1947. pp. 5. **1033**

In 1945, seed of Zenith, Blue Rose 41 and Nira varieties of rice were treated with Arasan, Ceresan, Phygon, Dow 9B and Spergon. In the following year a study was made of the effects of seed treatment with Arason, Ceresan, Phygon and Yellow Cuprocide on the stands and yields of Zenith, Prelude, Arkansas Fortune and Nira varieties grown in unfertilized plots, and in plots fertilized with cyanamid. Results indicate appreciable increases in stand and yield. Arason and Phygon were markedly effective for both years ; Dow 9B, yellow Cuprocide and Spergen were promising in one year. As it is impossible to predict the damage by seedling blight or any other seed-borne disease in any particular year, and since the cost of treatment is slight, seed should be treated every year.—P.M.

Myers, A. **The germination of sprung and shot seed wheat.** *Agric. Gaz. N.S.W.* **59.** 59-61. 1948. **1034**

A simple method of studying the germination capacity of seed wheat, based on a three or more days' test of 100 sample seeds spread on moistened absorbent material, is described.—G.M.H.

Norsk Landbruk. Varmtvannsbehandling mot naken sot på bygg og hvete. [**Warm water treatment to control naked smut of barley and wheat.**] *Norsk Landbr.* **14.** 133-4. 1948. **1035**

On the basis of results of experiments conducted by O. Lier (Society for Norwegian Welfare) and I. Jørstad from 1941-46 the following treatment is recommended : to control naked smut of spring wheat (*Ustilago tritici*) immersion for 2 hours in water kept at a temperature of 47°C. To control naked smut of barley (*Ustilago nuda*) steeping for 1.5 hours in water kept at a temperature of 47°C.

Steeping in warm Ceresan solution (0.1 per cent) caused greater injury to germination than steeping in pure water at the same temperature. —R.P.J.

Wilson, M. C. **A preliminary study of the effect of DDT on** *Aphis maidis* **Fitch and its insect enemies with particular reference to** *Aphidius* (*Lysiphlebus*) *testaceipes* (**Cress**). *Ohio J. Sci.* **48.** 30-40. 1948. [Dept. Zool. and Entomol., Ohio S. Univ., Columbus, Ohio] **1036**

The biology of the corn leaf aphid, *Aphis maidis* and its parasite, *Aphidius testaceipes*, is briefly reviewed. Field and laboratory experiments are reported of aphid infested field corn plants treated with DDT. Population studies were made of the aphid and its parasite. A few observations of predators are listed. In field tests, data taken 24 hours after treatment showed that DDT sprays were more effective against the corn leaf aphid than a nicotine-rotenone dust. One week after treatment nicotine-rotenone dust plots showed the same relative number of aphids killed as did DDT plots, but a lower relative number of parasites killed. One treatment of DDT did not eradicate the parasites unless the aphids were eliminated.

Further observations indicated that :

(1) *A. testaceipes* was susceptible to DDT at the lowest concentration used (1/64 lb. DDT per 100 gallons).

(2) *A. testaceipes* was not eradicated at the highest concentration used (2 lb. DDT per 100 gallons) but emergence was greatly reduced.

(3) Laboratory experiments with *A. testaceipes* showed a similar emergence curve for all treatments. The parasite emergence reached a peak, declined nearly to zero and then rose to another peak in 6 to 7 days. This parasite may complete a life cycle in 6 to 7 days. This indicates that parasites surviving DDT treatment, emerged as adults, mated, and oviposited in DDT treated aphids. The resulting offspring of the parasites were able to complete another cycle.—Author's summary.

Texas Agricultural Experiment Station. Bull. No. 689. **Sweet corn tests in the Lower Rio Grande Valley.** By *B. S. Pickett*. 1947. pp. 13. **1037**

Studies of sweet corn spacing begun in 1943 and completed in 1944, showed that maximum total yields were obtained with the variety Ioana, when approximately 27,000 plants per acre were grown. Planting rates of 11,000 to 13,000 plants per acre are however recommended, as this allows large ears to develop and total production is not seriously reduced. Studies on ear worm resistance were also carried out. The most resistant were varieties Bantam Hybrid 57, Golden Hybrid 54, Magnagold and Silvercross Evergreen. The varieties most susceptible to ear worm infestation were Golden

Rush Hybrid, Golden Cross Bantam and North Star.—P.M.

GERMEK, E. O "Gerasol P" no contrôle de insetos prejudiciais às sementes de milho armazenadas. [**"Gerasol P" in the control of insects injurious to the stored grain of maize.**] *Bragantia* **7.** 179-85. 7 pls. 1947. [Inst. Agron., Campinas, São Paulo, Brazil] **1038**

An account of trials of (a) machinery for disinfecting grain in the bag, and (b) different doses of "Gerasol P" (3 per cent DDT) for the control of insect infestation. Under laboratory conditions the disinfectant employed, whether in a dose of 20 gm. or of 60 gm. per 60 kg. sack, guarantees perfect conservation in Cateto maize even after 444 days (86 and 91 per cent germination, 87 and 96 per cent grain not attacked). Results in the storehouse were still better.—G.M.R.

REED, G. M., STANTON, T. R., and WILDS, G. J. **Reaction of oat varieties and selections to physiologic races A-30 and A-31 of loose smut.** *J. Amer. Soc. Agron.* **39.** 1077-87. 1947. **1039**

The paper includes results of extensive investigations conducted co-operatively by the Division of Cereal Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural Engineering, the Coker's Pedigree Seed Company and the Brooklyn Botanic Garden. It was found that two races of loose smut, A-30 and A-31, attack a large number of selections and varieties of oats hitherto considered smut resistant. Of the varieties and selections listed many involved the Red Rustproof group of oats, and most of these are resistant to races A-30 and A-31. It is believed that some or all of them may be susceptible to the Red Rustproof races of loose smut. It was noted that none of the known races of covered smut, *Ustilago Kolleri* infected the newly developed varieties and selections from Lee-Victoria crosses, yet the variety Lee is attacked by many of these races.—P.M.

OTANES, F. Q., and SISON, P. L. **Pests of rice.** *Philipp. J. Agric.* **13.** 36-88. 1947. [Agronomists, Plant Pest and Disease Control Divn., Bureau of Pl. Industry] **1040**

Information on the life histories, ecology and control of the different rice pests of the Philippines. Of the insect pests, the most important are the stem borers, army worms, rice bugs, rice case caterpillars, the Oriental Migratory Locust and the leafhoppers. Rats are undoubtedly the most destructive of the other pests. The pests are illustrated on 15 plates and a chart shows graphically the prevalence or period of abundance of the important ones. It is suggested that attention be given to the use of desirable varieties of rice, the need for fertilizers, sufficiency of water, better cultural methods and other things that will bring about a better stand of the rice plants. A suggested programme for the successful control of pests is given.—G.M.H.

BALDACCI, E. Ricerche ed esperienze sulle malattie del riso. III. Sulla biologia e sulla patogenicità dei ceppi italiani del *Fusarium moniliforme* Sh. [**Researches and experiences on diseases of rice. III. Biology and pathogeny of Italian strains of *Fusarium moniliforme* Sh.**] *Atti Ist. bot. Univ. Pavia* Ser. 5. **5.** 191-248. 1945. [Received 1948] **1041**

The author has studied two strains of *Fusarium moniliforme* isolated on rice plants in Italy, which show no substantial difference with those isolated in tropical and sub-tropical regions. The thermic optimum necessary for large infections is not reached in the Italian climate. This explains why damage in Italy is small in comparison with that reported, e.g. in Japan.—E.B.

RUDRIAH, M. P. **Field control of the earhead pests of jola** (*Andropogon sorghum*). *Mysore agric. J.* **25.** 48-53. 1946-7. **1042**

Though both varieties—the open and compact type of jola (*Andropogon sorghum*) grown in Mysore as Mungar (pre-monsoon) crop, are subjected to the attack of the pests, the compact type affords better facilities for the earhead pests to multiply and cause damage. The earhead bug (*Calocoris angustatus* L.), the earhead fly (*Contarinia andropogonis* F.) and three earhead caterpillars (*Eublemma silicula* S., *Celama internella* and *Stenochroia elongella* H.) cause appreciable damage to the crop. Each pest and measures for their prevention and control are described. A mixture of equal parts of very finely powdered soap and tobacco waste was used for large scale dusting of jola earhead at all stages of growth with excellent results. All ryots are advised to complete sowings of jola by the beginning of April, in "Revathi" rains alone, so that harvest can be done by the beginning of August.—G.M.H.

SALLANS, B. J. **Interrelations of common root rot and other factors with wheat yields in Saskatchewan.** *Sci. Agric.* **28.** 6-20. 1948. [Dominion Lab. Plant Pathol., Saskatoon, Sask.] **1043**

An attempt was made to measure the relation of common root rot to wheat yields in Saskatchewan using the methods of correlation and partial regression. Since a number of factors interact with common root rot in influencing yields, data were collected for rainfall of the growing season (June and July), for air temperatures of the same period, for pre-seasonal rainfall excluding winter precipitation, and for insect damage. The statistics were assembled on the basis of the nine crop districts of the province as units over a period of ten crop seasons.

The simple average common root rot rating over the periods and areas covered by the data is 8.8. This may be taken as an estimate of the percentage loss. Some of the weaknesses of such an estimate are discussed.

The coefficient of correlation between rainfall in the June-July period and wheat yield was 0.717, while that between pre-seasonal rainfall and wheat yield was 0.466.

Considerable precipitation during June and July tends to suppress common root rot lesions, and light rainfall appears to favour increases in incidence and degree of severity of lesions. Pre-seasonal rainfall and June-July rainfall favoured wheat yields as shown by the partial correlations 0.503 and 0.469, respectively. Depressing effects on yields were indicated by the partial correlations of −0.215, −0.349, and −0.283 between yields and air temperature, common root rot and insect damage, respectively.

Partial regressions of wheat yields on five independent variates accounted for 77.8 per cent of the variance in wheat yields. Each of the five independent variates were related to wheat yields in a highly significant degree. The variance in yield associated with common root rot was second only to that portion related to June-July rainfall.

On the basis of the partial regression of wheat yields on common root rot ratings it is estimated that the average loss associated with this factor is 5.14 bu. per acre, with 95 per cent fiducial limits of 1.55 and 8.73 bu. per acre. Some factors which may reduce this estimate are discussed.—From Author's summary.

Platt, A. W., Farstad, C. W., and Callenbach, J. A. **The reaction of Rescue wheat to sawfly damage.** *Sci. Agric.* **28.** 154-61. 1948. [Dom. Expt. Sta., Swift Current, Sask. (P.A.W.), Dom. Ent. Lab., Lethbridge, Alberta, (C.W.F.), Montana Agric. Expt. Sta. (J.A.C.)] **1044**

Rescue wheat was developed for resistance to attack by the wheat stem sawfly. It was selected in 1942 and is the result of a cross between Apex and S-615. Between 1943 and 1947 tests were carried out in Saskatchewan, Alberta and Montana to obtain data on its field behaviour to sawfly attack. In nursery tests, Rescue showed a high degree of resistance in four out of five instances. In 22 yield tests, resistance was satisfactory. In different years the degree of resistance varied from good to unsatisfactory in nursery trials. In contrast field plantings showed high resistance. Reasons for variation in damage are not known.—P.M.

Australia, Council for Scientific and Industrial Research. Bull. No. 225. **Studies on the control of wheat insects by dusts. 1. Field tests of various mineral dusts against grain weevils.** By *F. J. Gay, F. N. Ratcliffe,* and *R. N. McCulloch.* 7-20. 1947. **1045**

These tests were carried out at Toowoomba district in South Queensland where wheat grown and stored has a high moisture content and where climate favours insect development, and at Seven Hills, near Sydney, New South Wales, where climatological conditions are reasonably typical of wheat storage sites adjacent to the southern Australia ports. The dusts used were "Neosyl" and exceedingly finely divided silica, magnesite, dolomite, limonite and hydrated lime, and copper oxychloride. At Toowoomba, where the dominant insects were *Calandra oryzae* and *Rhizopertha dominica*, the three dusts tested, magnesite, dolomite and "Neosyl" gave similar results, and each maintained the wheat in reasonable condition for 12 months. At Seven Hills, where the important insects were *Calandra granaria* and *C. oryzae*, the order of decreasing effectiveness of the dusts tested was: magnesite, copper oxychloride, "Neosyl," dolomite, limonite, and hydrated lime.—G.M.H.

Australia, Council for Scientific and Industrial Research. Bull. No. 225. **Studies on the control of wheat insects by dusts. 2. Further tests of various mineral dusts for the control of grain pests.** By *F. J. Gay*. 21-9. 1947. **1046**

Seventy dusts were tested against *Calandra oryzae* (large strain) and *Rhizopertha dominica* at two levels of relative humidity, 45 per cent and 65 per cent, and at two dosage rates, 0.5 per cent and 1 per cent by weight of the wheat. The two outstanding materials were two imported proprietary alumina dusts.—G.M.H.

Marini-Bettòlo, G. B., and Borzini, G. Sull' azione di alcuni complessi mercuriorganici nella prevenzione della carie del frumento (*Tilletia* spp.). 1. Risultato delle esperienze preliminari. [**Effect of some mercuric-organic complexes in the prevention of bunt of wheat** (*Tilletia* **spp.**). **1. Results of preliminary experiments.**] *Atti Ist. bot. Univ. Pavia* Ser. 5. **3.** 244-52. [English summary, p. 252.) 1943-47. **1047**

It is possible to combat successfully bunt of wheat with organic products containing relatively small proportions of mercury (1-4 per cent metallic mercury). The complexes obtained from benzaldehyde, anisic aldehyde and salycilic adlehyde with mercuric chloride have proved to be the most effective. The effect of these products on absolute germinability is very small, while the speed of germination may decrease after treatment with complexes obtained from several aldehydes and mercuric chloride.—E.B.

WELLENSIEK, S. J. Veredelingsonderzoekingen met rogge VI: de directe invloed van het stuifmeel op het korrelgewicht. **Investigations on the breeding of rye. VI: the direct influence of the pollen on the weight of the kernel.** *Landbouwk. Tijdschr.* **60.** 125-7. [English summary, p. 127.] 1948. **1048**

Fifty plants of a rye clone were pollinated by pollen of a rye variety with very heavy kernels, averaging more than 45 mg. Fifty other plants of the same clone were pollinated by pollen of a rye variety with kernels with a very low weight, averaging less than 23 mg. The differences of the mean weights of the kernels of the clonal plants after pollination with "heavy" pollen and with "light" pollen respectively were:

in 1941: + 6.9 ± 3.96 per cent
in 1942: − 18.8 ± 8.64 per cent
in 1943: + 3.6 ± 5.79 per cent

It is concluded that the pollen does not exercise an appreciable direct influence on the weight of the kernel. This conclusion is in harmony with other investigators working with different methods.—Author's summary.

BALDACCI, E. Ricerche ed esperienze sulle malattie del riso. IV. Alcune manifestazioni di sterilità della pannocchia. [**Researches and experiences on diseases of rice. IV. Some manifestations of sterility of the spike.**] *Atti Ist. bot. Univ. Pavia.* Ser. 5. **5.** 249-74. 1945. [Received 1948] **1049**

Numerous cases of pathological alteration of rice, with partial or total sterility of the spike, are illustrated. The different causes of this alteration are reported.—E.B.

BALDACCI, E., and CIFERRI, R. Studi sulla "stretta" dei cereali. I. [**Studies on premature ripening of cereals.**] *Atti Ist. bot. Univ. Pavia.* Ser. 5. **1** (**3**). 215-76. 1944. [Received 1948.] **1050**

The ecological conditions under which premature ripening takes place in nature, the damage caused and the means used to prevent it are examined.

The experimental conditions in relation to the different stages of development of wheat and the ecological factors for the reproduction of the phenomena are then determined. These factors are summarized as follows: treatment of wheat plants in the initial stage of ripening with hot winds with temperatures above 27°C. for length of time starting from 2 hours upwards and with wind velocities ranging from 2 to 12 metres per second. The results are analysed separately for the two varieties of wheat considered, i.e. the Mentana mesophyte) and the Cappelli (xerophyte).—E.B.

GLOVER, J. **Water demands by maize and sorghum.** *E. Afr. Agric. J.* **13.** 171. 1948. [E.A.A.R.I., Amani] **1051**

A diagram derived from records of average daily transpiration of maize and sorghum at Amani shows low water requirements while the plants are young, rising to a broad peak during heading and flowering, thereafter diminishing as the seed matures and the plant dies. Except for differences due to species the curves are similar. This important period of peak demand must be anticipated either by conservation of soil moisture, by planting so that the peak falls in or immediately after the most suitable period of the average rains, by irrigation, or by a combination of some or all these methods.—G.M.H.

PURVIS, O. N. **Studies in vernalisation. XI. The effect of date of sowing and of excising the embryo upon the responses of Petkus winter rye to different periods of vernalisation treatment.** *Ann. Bot., Lond.* **12.** 183-206. 1948. [Imp. Coll. Sci. Tech., London, S.W.7.] **1052**

The existence of a 'time-lag' in the vernalization of excised embryos as compared with whole grain is confirmed by further experiments. After the 'lag' period vernalization proceeds at the same rate as in whole grain. It is suggested that during the 'lag' period a substance requisite for vernalization is synthesized, which in whole grain is transferred from the endosperm or aleurone layer.

Low temperature is necessary for either the synthesis or the accumulation of this substance in the embryo. Its transference from the endosperm is also facilitated by low temperature. It cannot be replaced by adding heteroauxin, dried yeast, or ground rye endosperm to the medium on which the embryo germinates.

A similar delay in the inception of vernalization appears to occur when whole grain is planted late in the season (May 17). By means of a sowing-date experiment, it is shown that this delay is entirely due to factors operating *after* planting. The course of vernalization in whole grain is shown to resemble that of an autocatyltic reaction.—Author's summary.

KIESSELBACH, T. A. **Endosperm type as a physiological factor in corn yields.** *J. Amer. Soc. Agron.* **40.** 216-36. 1948. [Agron. Dept. Neb. Agric. Expt. Sta., Lincoln, Neb.] **1053**

The following theory is advanced: "Carbon accumulation is influenced inversely by the concentration of water-soluble photosynthates within the vegetative parts of the plant, which in turn is modified by the degree of translocation to the grain. Gene-controlled enzyme relationships within the developing grain which lead to more complete translocation either indirectly accelerate photosynthesis within the leaves or lower the losses by respiration and thereby increase the yield of total dry matter as well as of grain. On the other hand, less efficient translocation, whether due to a different enzyme complex or to failure of grain development, results in a higher concentration of water-soluble carbohydrates within the vegetative organs, and thereby reduces the capacity for carbon accumulation and crop yield."—From Author's summary.

GROSZMANN, A., and SPRAGUE, G. F. **Comparative growth rates in a reciprocal maize cross: 1. The kernel and its component parts.** *J. Amer. Soc. Agron.* **40.** 88-98. 1948. **1054**

Growth rates were determined for the whole kernel and its component parts for dent and pop corn inbred lines and their reciprocal hybrids. Considering the whole kernel, both hybrids exhibited heterosis. A study of growth rates of their component parts, however, indicated heterosis was due to different causes in the two hybrids. This was explained on the basis of relative efficiency of endosperm and embryo as competitors for food materials.

Heterosis appeared to be related to the action of specific genes rather than chromosomal dosage effects.—Authors' summary.

CHAKLADAR, M. N. **Influence of soil moisture on the yield of paddy.** *Indian J. agric. Sci.* **16.** 152-64. 1946. [Dept. Agric., Bengal] **1055**

The experiment was conducted with the "aus" type of *Oryza sativa,* which is grown in the highland tracts of Bengal and completes its growth in 80-90 days. Soil in the pot cultures was kept at three moisture conditions: 75 per cent of the maximum saturation capacity; 50 per cent and 33 per cent. Evaporation and transpiration losses were measured at the three moisture states for a series of seven different watering intervals represented by a group of rice plants for each interval. The watering intervals ranged from 3 days to 21 days with increases of 3 days for each series. During the early growth stages the watering intervals had little effect on the plants, but during the later stages total crop failure was produced by infrequent watering, particularly in the case of low moisture conditions. The plants were examined for their straw, number of tillers, height and seed formation and the results are statistically presented.—M.E.E.

REIFENBERG, A., and ROSOVSKY, R. **Saline irrigation water and its effect on the intake of ions by barley seedlings.** *Pal. J. Bot.* J. Ser. **4.** 1-13. 1947. **1056**

Barley seedlings were grown in saline natural irrigation water of different dilution and with the addition of varying quantities of nutrients. The intake and interrelationship of the various ions concerned were followed. Results show that it might be possible that fertilization with potash and phosphates will prevent the intake of sodium chloride from saline irrigation water.—G.M.H.

KELLY, S. **The relationship between respiration and water uptake in the oat coleoptile.** *Amer. J. Bot.* **34.** 521-6. 1947. [Brooklyn Botanic Garden, Brooklyn, 25, New York] **1057**

Since it was established that carbohydrate metabolism is dominant in *Avena* coleoptile, inhibitors of carbohydrate metabolism in animal tissues were the agents used in these experiments. They inhibited respiration and water uptake of the coleoptile simultaneously and to a similar degree. Indoleacetic acid (plant growth hormone) stimulates respiration and water uptake in the same concentration range that stimulates growth of the coleoptile. Water uptake and its stimulation by indoleacetic acid are aerobic process.—D.B.

OKLAHOMA Agricultural Experiment Station. Tech. Bull. No. T-30. **Chemical composition of sorghum plants at various stages of growth, and relation of composition to chinch bug injury.** By *J. E. Webster, J. Sieglinger* and *F. Davies.* 1948. pp. 32. **1058**

Results give little indication of any factor with a positive correlation for resistance and it is suggested that possibly a variety of factors may be concerned. Chemical analyses were made of several sorghum varieties, and included analysis for solids, ash, mineral elements, sugars, nitrogen, tannins, hydrocyanic acid and certain enzymes. No definite chemical differences in varieties could be correlated with chinch bug resistance; differences could be found between selected resistant and susceptible varieties, but they disappear when a greater number of varieties are compared. There was no correlation between tannins and hydrocyanic acid contents and chinch-bug resistance. Classification of sorghums at time of maturity into saccharine and non-saccharine did not apply to the young plants; up to the commencement of heading, there were only slight differences in the total sugar content of immature plants and some which were classified "sweet" were lowest in sugar content when immature. No material differences were observed in a chemical study of 2 varieties, each having a resistant and a moderately susceptible strain.—P.M.

KENT-JONES, D. W., and AMOS, A. J. **Modern cereal chemistry.** 4th edn. 25 × 16. pp. vii + 651. Liverpool: The Northern Publishing Co. Ltd. 1947. £2 10s 0d. **1059**

The fourth edition of this standard work includes many advances made in cereal chemistry since 1939 and devotes more space to cereals other than wheat than do previous editions.

The first four chapters describe the main features of wheat, barley, oats, rye, maize, rice, soybeans and potatoes. The cereals are dealt with from the standpoint of geographical distribution, yield, general characteristics of the grain, susceptibility to disease, microscopical appearance of starch grains, chemical composition of the grain and products, and the use of some of these as animal foods. Various processes such as the milling of wheat and the malting of barley are described.

A good deal of attention is devoted to the chemical composition of wheat, flour of various degrees of extraction, wheat offals and germ, the chemistry of wheat starch and other characters not demonstrable by chemical analysis but of importance in baking, e.g. the characteristics of starch grains mechanically damaged during milling ; wheat proteins including elementary and amino acid analysis, wheat cellulose, fat, sugars, dextrin, enzymes and mineral matter including trace elements.

The principal wheats of the world are considered in relation to yield, time of harvesting, baking qualities, stability and strength as measured by dough testing machines, chemical composition and general characteristics, fungoid and insect pests and common weed seeds.

The chemical composition of barley is discussed with reference to the qualities desirable for malting and brewing, particularly the striking relationship between nitrogen content and market valuation. Analyses of malts are given and interpreted.

Among the properties of the other cereals discussed are the amino acid content of their proteins, vitamin content, nutritive value and use in the manufacture of breakfast cereals.

One chapter is devoted to a description of the following fundamental physico-chemical concepts and their significance in relation to cereal problems, the colloidal state, hydrogen ion concentration, isoelectric points and oxidation-reduction potential.

The strength of flour is discussed with reference to the conditions necessary to produce a large and nicely textured loaf and investigations on the following aspects in relation to strength, viscosity of flour, water suspensions, gluten, the physical properties of dough, racemisation of flour proteins and their behaviour when digested with various salt solutions, and the addition and extraction of fatty substances.

The object of conditioning or tempering, i.e. treatment of flour with moisture and heat to facilitate milling and improve baking quality mainly by influencing the distribution of moisture in the grain, is described, together with the accompanying changes and modern views on conditioning. Reference is made to the effects achieved by the application of heat and also by adding chemicals.

The technical terms associated with milling are defined, and the special measures introduced when extraction was raised to 85 per cent are described. Detailed analyses and results of baking tests carried out on various grades of flour immediately after milling and after 4 months storage are given ; also details of the ash content of flour products together with results obtained in American mills. Methods of determining the size of flour particles and the importance of particle size are dealt with.

Discussion of the technique and chemistry of the baking process includes a description of the essential features of, and physico-chemical changes involved in the fermentation and ripening of dough, methods of bread making, the rôle and importance of yeast, baking plant and types of ovens, faults in bread and test baking by various British and foreign systems. Other aspects of the science of bread making dealt with are diastatic and proteolytic action as affecting panary fermentation and baking quality, and the action of phytase as affecting the nutritive value of bread ; the production and retention of gas in the dough, acid production, free and bound water, the flavour of bread, and staling.

Bleaching and the addition of substances in order to improve the baking quality of flour are dealt with from the point of view of the type of substances used and the nature of their action, and from the legal aspect. Improvement by physical methods, particularly the addition of small quantities of heated flour is considered. Dough testing apparatus is discussed and two modern types, namely, of the dynamic and static type are described. Reference is also made to apparatus for measuring the gassing properties of flour, and also to certain non-mechanical methods of examining the quality of flour and dough, such as the Pelshenke disintegration test and the Berliner swelling test. The authors consider that most useful results will be produced when apparatus and methods are improved.

The use of wheat and flour for special purposes, namely for making self-raising flour, baking powder, biscuits, confectionery, macaroni, dog biscuits and alcohol are considered from the point of view of the type of flour best suited to each purpose. The use of flour for making alcohol as a step in the manufacture of synthetic rubber became important during the war.

In considering the nutritive value of cereals, the basic principles of nutrition are outlined, and followed by a description of the early work on the nutritive value of cereals and bread with special reference to the effect of the degree of extraction of flour, and the very great value of all types of bread. Recent investigations relate to the result of nutritional surveys, the effect of phytic acid on the absorption of calcium and iron, the effect of degree of extraction on nutrient availability, the nature of "near white" flour of low fibre but comparatively high vitamin B content, and the enrichment of white flour and bread in Britain and America. It is pointed out that the pre-war controversy relating to the merits of white bread from flour of about 70 per cent extraction versus wholemeal bread (about 95 per cent extraction), has given place to that between near white flour of about 80 per cent extraction and fortified or enriched flour, i.e. supplemented by minerals and vitamins. Data are given for the content of B vitamins in cereals.

Changes in the nomenclature of wheat by-products are discussed. An outline of the elementary principles of animal nutrition is followed by the evaluation of the nutritive value of animal foods in terms of starch and protein equivalents, and a description of the general characteristics of the principal feeding stuffs, with brief reference to the manufacture of such foods as flaked maize, barley meal, oatmeal and compound foods. Examples illustrating typical balanced rations for beef and dairy cattle, sheep, horses, pigs and poultry are given. Reference is also made to seeds and like substances injurious to animals and to the importance of trace elements.

A chapter on the microbiology of cereals deals with the general morphology and physiology of bacteria, yeasts and moulds, those found in cereals especially wheat products, micro-organisms and panary fermentation, spoilage of bread, and spontaneous heating of cereal products during storage. Chapter 16 deals with the three types of methods of determining moisture in cereals, namely, direct and indirect distillation methods, rapid electrical methods and the chemical or titration method.

The two succeeding chapters deal respectively with the general analytical procedure for cereals, and vitamin assay of cereal and cereal products.

The appendix includes a number of useful tables chiefly relating to the calculation of principal ingredients contributed by various amounts of common feeding stuffs, and an extensive bibliography is given. The text is illustrated by plates, graphs and numerous tables.—W. M. Ashton.

UNITED STATES Department of Agriculture. Tech. Bull. No. 942. **Taxonomic value of characters in cultivated barley.** By *E. Åberg* and *G. A. Wiebe*. 1948. pp. 88. **1060**

Hitherto very little work has been done to determine the taxonomic value of the various characters in cultivated barleys grown under very different environmental conditions. The investigations reported in this bulletin were started in 1942; in the following two years, field studies were extended when nurseries of winter and spring barleys were grown. Sixty-nine winter varieties, and 119 spring varieties were studied. They were grown at 13 stations in U.S.A. and 2 in Canada in typical barley production areas so as to include a wide range of environment. Each character is discussed and classified or grouped in tables. Characters are placed in two groups, those useful in taxonomic work (which are discussed and illustrated) and those not useful in taxonomic work.—P.M.

ANTROPOV, V. I., and ANTROPOV, V. F. Sinópsis de las especies y variedades del género *Secale*. [**Synopsis of the species and varieties of the genus** *Secale*.] *Rev. argent. Agron.* **15.** 33-52. 1948. **1061**

The article is translated into Spanish by *J. Bukevicius* and *C. Cialzeta* from the Russian (C. A. Flaksberger, V. I. and V. F. Antropov, F. J. Bajteev, A. I. Mordvinkina. Determination of true cereals, Moscow, 1939). Notes on geographical distribution accompany the taxonomic descriptions and keys.—G.M.R.

LEGUMES AND GRAIN LEGUMES

NOONAN, J. B. **Production of field beans in New England. A profitable leguminous rotation crop.** *Agric. Gaz. N.S.W.* **58.** 575-7 and 629-33. 1947. [District Agronomist] **1062**

The New England (or Northern Tableland) districts of New South Wales have been found to be best suited for the growth of field beans. Optimum climatic conditions are (a) a frost-free period of about 120 days, (b) a relatively cool growing season with an ample, well-distributed rainfall —about 17 inches November to March inclusive, (c) a dry harvesting period. The granitic soils and red loams of the district have been found most suitable but any well drained soil with a reasonable clay content is satisfactory. Information is given on sowing, fertilizers, cultivation of the crop, harvesting, varieties of beans and diseases and pests.

Four varieties have been grown commercially in New South Wales, but the great bulk of beans produced have been of the Little Navy or Small White Variety. This bean is a good yielding type which takes about 120 days to mature, and has small seed typical of the type always desired by Australian canners. Little Navy is very liable to second growth if sown before mid-November. The only other variety now grown to any extent is Michelite, which is about 10 to 14 days earlier than Little Navy in maturity. It is rounder and easily graded and a little larger than Little Navy, but is excellent for the canning industry. Two other types which have been grown commercially are Pinto and Great Northern.—G.M.H.

Ryzhikov, N. **Utilization and cultivation of soybeans in the U.S.S.R.** *Soybean Digest* **7.** 12. 1947. **1063**

The soybean was grown in small areas only in the Soviet Far East prior to the Revolution, but by 1939 there were large soya plantations on the collective farms of Ukraine, Georgia and North Caucasus and the Far Eastern plantations increased in size four times between 1926 and 1943. The 1939-45 war caused immense damage to the soybean areas, but by 1948 it is hoped to bring the plantations up to pre-war production. Tested varieties have already been selected with average ripening and yield properties suitable for cultivation on large farms in different districts of the USSR. Varieties most widely propagated are Amurskaya Zheltaya 041 and 042, Ussuriiskaya 029, Staroukrainskaya, Kharkovskaya 149, Kharbinskaya 231-a and Kubanskaya 276. All are distinguished by their high crop yield and rich albumen and fat content. Sowing is done by tractor-drawn grain seeders and cultivation by tractor cultivators ; the crop is mainly combined.

In 1947, 20 per cent of the actual sown areas was set aside for seed, thus ensuring a sufficiency of high grade seeds. On leading farms the yield is over 30 centners per ha., and this figure has been exceeded even under adverse weather conditions. In the national economy, soybean plays a large part. It is used in the preparation of many foodstuffs ; refined, its products are used in the aviation, motor car, rubber lacquer, dyes, butter, soap and casein industries, whilst fodder varieties and concentrates made of soya waste are widely used by the livestock farms.—P.M.

Tekeli, S., and Yazicioğlu, T. Soya fasulyesi ve kiymetlendirme imkânlari. [**Soybeans and possibilities of proving their value.**] *Ankara Yüksek Ziraat Enstitüsü Dergisi* 1947. No. 2. 433-43. **1064**

The author explains the value of soybeans and strongly recommends their wider cultivation in Turkey.—Faud Sami.

Ministère De La France D'Outre Mer. Bull. Agron. No. 1. Observations sur les possibilités de culture du soja en Guinée forestière. [**Observations on the possibilities of cultivating soybean in forestal Guinea.**] By *R. Portères.* 1946. pp. 82. **1065**

Soybean was first introduced into forestal Guinea in 1935. Experiments at the Sérédou station conducted in 1939-40 show promising results. The best period for vegetation is from October to March in low irrigated lands, and until June in high lands. The vegetation period varies from 80 to 160 days for the different varieties (in the short cycle varieties branching is very reduced). Soybean can be cultivated for export or for local consumption both as forage and as food for the natives. Soybean for export must be harvested during March-April and exported during the dry season. As a food for the natives it can be a supplement during the difficult months of June-July. Soybean seeds lose their germination power during the rainy season, it is therefore necessary to have a little cultivation during June, August and September in order to produce the necessary seeds for export. This cultivation cannot be integrated in the cultivation for food as it produces in a season when rice, which is preferred by the natives, is available.—E.B.

Rodrigo, P. A. **Soybean culture in the Philippines.** *Philipp. J. Agric.* **13.** 1-22. 1947. [Hart. Res. Sectn., Bureau of Pl. Ind., Philippines] **1066**

The soybean has a great potential place in Philippine agriculture. It can be easily grown in many sections of the country and fits easily into any system of crop rotation. Tables giving annual importation figures show that there is also a local market for soybean and its products. Detailed accounts are given of all aspects of soybean culture, climatic and soil requirements, propagation, preparation of the soil, fertilizers and lime, inoculation, planting, care of crop, harvesting and production, uses of the bean, insect pests and diseases. At present only four to seven varieties, excluding the Ami, which has long been under cultivation in the Philippines and is well adapted to the varied soil and climatic conditions, may be considered good for commercial planting. Based on the results of a number of years' trial tests in different regions on the Islands, Yellow Biloxi Hybrid, Mis 33 Dixi, Mis 28E. B. Str. 3910, Head Green and American Black have been found to be productive. —G.M.H.

Orman, A. C. **Growing green peas.** *Agric. Gaz. N.S.W.* **59.** 65-8. 1948. **1067**

A short memorandum on the growing of green peas in New South Wales. Although the pea crop requires for its best development a temperate climate, the range of conditions in the State is such that the crop can be harvested in one part or another during every month of the year. In addition to yielding profitably, peas contribute to the soil fertility by increasing the nitrogen store and provide a considerable quantity of top-growth which rots down readily when turned under. Information is given on sowing and cultivation, fertilizers, yields, harvesting and marketing, varieties (Greenfeast is the variety favoured for field culture) and diseases and pests.—G.M.H.

Inforzato, R. Nota sôbre o sistema radicular do gandu, *Cajanus cajan* (L.) Millsp., e a sua importância na adubação verde. [**Note on the**

rooting system of *Cajanus cajan* **and its importance as a green manure.**] *Bragantia* **7.** 125-6. pl. 1947. [Inst. Agron., Campinas, São Paulo, Brazil] **1068**

Cajanus cajan (= *C. indicus*) is an Asiatic egume which is valuable in São Paulo as green feed for cattle and for restoring fertility to exhausted soils. The author has studied the rooting system n a row of eight representative 2-year-old plants approximately 4.5 m. in height. The total root weight was 1237.04 grm. and the weight of the aerial parts 17,200 grm. Of the total root weight, 90.67 per cent was found in the top 30 cm. soil layer, the remaining 9.33 per cent between 30 cm. and 2.95 m. The roots are very evenly distributed, and to this fact and the depth reached is attributable the plant's valuable ability to remain green and furnish good fodder throughout prolonged periods of drought. As green manure it can furnish, under the conditions of the Campinas trial and per alqueire, 14,968 kg. roots and 208,124 kg. organic matter for ploughing in. [1 alqueire in São Paulo = 24,200 sq. m.]—G.M.R.

ROGERS, H. T. **Liming for peanuts in relation to exchangeable soil calcium and effect on yield, quality, and uptake of calcium and potassium.** *J. Amer. Soc. Agron.* **40.** 15-31. 1948. **1069**

The experiments were conducted in central and southern Alabama on sands and sandy loams, which ranged in exchangeable Ca content calculated as $CaCo_3$ equivalent from 160 to 1241 lb. per acre; the critical level of exchangeable Ca in unlimed soils for Spanish and runner peanuts ranged from 600 to 800 lb. per acre. Soils containing more than the equivalent of 700 lb. of $CaCo_3$ per acre showed only small increases in yield for lime; soils containing less than 600 lb. per acre gave marked increases. The major beneficial effect of lime on peanuts seems to be the supplying of Ca and Mg as plant nutrients, for, 4 years after applying 1500 lb. limestone, the applications produced from 900 to 1500 lb. of peanuts more than unlimed plots in an intensive cropping experiment.

On soils which had been treated with lime, peanuts showed improved quality, demonstrated by increased shelling percentage of runner peanuts when grown successively for several years on the same soil. The addition of lime decreased the percentage of K in the vines by as much as 30 to 46 per cent. " This reduction in K content of peanuts by liming a Ca-depleted soil was attributable in part to increased growth and increased the efficiency of utilization of applied K from 27 to 73 per cent by Spanish peanuts. Similarly lime increased the utilization of K by runner peanuts from 42 to 85 per cent."—P.M.

BRADY, N. C., REED, J. F., and COLWELL, W. E. **The effect of certain mineral elements on peanut fruit filling.** *J. Amer. Soc. Agron.* **40.** 155-67. 1948. **1070**

Results of experiments show that of the ions Ca, K, Mg, Cl, SO_4, KH_2, and PO_4, calcium was the only one which consistently increased fruit filling when applied to the fruiting zone. The addition of magnesium salts to the fruiting zone was only slightly beneficial to fruit filling. When potassium was added to the fruiting zone or rooting medium, it depressed fruit filling in instances where there was an absence of calcium in the fruiting zone; if a solution of calcium sulphate containing as little as 20 p.p.m. calcium was supplied, no detrimental effect resulted from potash additions. Application of chloride, sulphate and phosphate ions to the fruiting medium did not markedly affect fruit filling.—P.M.

GASPAR, F. Cultivo de la soja. [**Cultivation of soybean.**] *Agricultura* **16.** 201. 1947. **1071**

Instructions are given on the cultivation of soybean (Early Yellow variety). It is necessary to prepare the soil by deep ploughing during the winter, followed by a light working to soften it. Fertilizers (superphosphate, potassium chloride, and nitrate) can be used. In southern Spain sowing time is April, when frosts are over. The furrows should face the south so that the new plants have protection from the north wind. Width of furrows should be 40 cm.; holes in the hollow, 25 cm. apart. In every hole, two seeds should be put at a depth of 3 cm. and covered with earth without pressing. Two irrigations are generally sufficient; no irrigation must be given after the flowering. Plants are pulled up a little before they are ripe. Soybeans are used for human food, and they are also ground into flour and mixed with other products for stock feeding.—E.B.

KERLE, W. D. **Soybeans. Greater yields obtained by harrowing growing crops.** *Agric. Gaz. N.S.W.* **59.** 9. 1948. **1072**

Growing soybeans benefit from harrowing, but it must take place before inter-row cultivation, otherwise the young plants are harrowed out. Harrowing across the rows is the most effective means of checking weed growth (particularly in the rows themselves) provided it is done on a warm day and the plants are from 4 to 6 in. high. The plants in the harrowed sections of an experiment were taller and more vigorous and the weed growth was only light whereas in the non-harrowed areas the soybeans were stunted and yellowish and weed growth was profuse.—G.M.H.

LANG, A. L. **Fertilizing for soybeans.** *Soybean Digest* **7.** 18 and 28. 1947. **1073**

A fertilizer programme for soybeans which has been proved to be effective by more than 30 years' results, is outlined. The problem of returning plant food removed from the soil by the soybean is a matter of determining the needs of the entire cropping system. The needs of a typical Corn Belt rotation including corn, soybeans, small grain and legumes are analysed. High productivity of the soybeans will depend on the amount of legumes that can be ploughed down preceding the growing of the corn crop. The amount of a legume which can be grown is largely determined by the nutrient-supplying power of the soil and therefore the first efforts towards soil improvement should be directed to and for the legume hay pasture and manuring crop. " When sufficient limestone, potash, and phosphate are applied to meet the maximum requirement of the legume forage crop in rotation, grain crops like corn and soybeans will be amply cared for, providing enough of the forage crop is returned to the land in either green or animal manures."—P.M.

INFORZATO, R. Estudo do sistema radicular de *Tephrosia candida* D.C. [**Study of the root system of *Tephrosia candida* D.C.**] *Bragantia* **7.** 49-54. 2 pls. 1947. [Inst. Agron., Campinas, São Paulo, Brazil] **1074**

Tephrosia candida, a leguminous shrub from tropical Asia which was introduced into the State of São Paulo in 1930, has become acclimatized, attains a height of some 5m. in good soil, and is useful as shelter and fixer of nitrogen in coffee plantations, for soil conservation on slopes and for other purposes. A study of the root system in 16 plants showed 99.14 per cent of the root weight, in the red soil type concerned, to be situated in the first 50 cm. layer; the maximum rooting depth measured was 3.85 m. The total root weight of the 16 plants was 8810.12 grm. Thus a row of *Tephrosia* plants standing 35 cm. apart would provide the soil in 5 years with a total weight of 87,022 kg. roots, rich in nodule bacteria, per alqueire. [1 alqueire in São Paulo = 24,200 sq. m.]—G.M.R.

SNOOK, L. C. **Locally grown leguminous seeds.** *J. Dept. Agric. W. Aust.* **24.** 300-12. 1947. **1075**

The composition and food value of field peas (*Pisum arvense*), West Australian blue lupin (*Lupinus varius*), New Zealand blue lupins (*L. angustifolius*), yellow lupins (*L. luteus*) and Tangier peas (*Lathyrus tingitanus*) are discussed. Tabulated data show marked uniformity in the composition of seeds of the same species despite the fact that samples were collected over a period of years from districts with markedly different climatic conditions. Field peas are considered very valuable supplements to stock on dry feed but it is suggested that more dependable legumes may be grown. Tangier peas were found to contain more crude protein than any other edible seed investigated, the six samples averaging 40 per cent in the dry matter. The possible value of selected strains of vetches (*Vicia* spp.) as a source of green food and protein-rich seed is also discussed.—G.M.H.

SWEDEN, Lantbrukshögskolan Jordbruksförsöksanstalten. Medd. Nr. 21. Försök med ärter och ärtblandsäd vid Statens Försöksgård Offer åren 1935-1946. [**Experiments with peas and mixed seed including peas at the State Experimental Farm Offer during the years 1935-1946.**] By *G. Ericsson* and *M. Genchel.* 1947. pp. 67. [English summary, pp. 58-60.] **1076**

Eight and 4-year experiments have shown the greatest possibilities for the production of fodder albumen connected with the cultivation of peas and pea-mingled mixed seed in northern Sweden. The grain yield of the pure-pea crops was 70 per cent that of oats. For mixed seed and pure oats the difference was slight, but the grain yield of Bredanger field peas was 4 per cent higher than that of oats. Estimated amount of digestible raw protein per ha. is highest in pure pea crops, between 159.1 and 167.6 (relative figures). Bredanger field peas also yielded together with Orion II oats the greatest amount of digestible raw protein of the three categories of mixed seed, viz. in relative figures, 145.

Peas included in the experiments have yielded a higher thousand-grain weight in mixed seed crops than corresponding peas in a pure pea crop. Orion oats needed on an average 87 days from sowing to harvest while the corresponding figures for Bottnia field peas, Bredanger field peas and Svalöf early yellow peas in a pure pea-crop were 91, 93 and 92 days respectively.—P.M.

ÅKERBERG, E., and BINGEFORS, S. Baljväxtodling—några erfarenheter från de senaste årens försöksverksamhet. [**The cultivation of leguminous crops in Sweden—some experiences from trials conducted during recent years.**] *Svensk Jordbr. Forskn. Årsbok* 1947. 87-99. **1077**

The area of leguminous crops sown pure was, at the end of the sixth decade of the nineteenth century approximately 50,000 ha. but had from 1911 to 1915 declined to an average of only 32,000 ha. In 1939 it had fallen to 18,000 ha. Owing to the war and the blockade, the area in 1943 had increased to 39,000 ha. In 1945 it was approximately 31,000 ha., of which 25,800 ha. were sown with peas, 4700 ha. with vetch and 350 ha. with horse beans.

In trials with peas conducted by the Institute of Agricultural Research, the yield was 8 per cent higher on light clay soils and 22 per cent higher on medium clays and stiff clays than on sandy soils. In these trials the ley was found to be the best preceding crop in south and middle Sweden, closely followed by potatoes and roots. Spring sown cereals were the poorest preceding crops. In trials in Norrland, however, the ley proved the poorest preceding crop, while spring sown cereals were best.

Vetch has given the best results in east Sweden. The cultivation of field beans is very restricted and is concentrated mainly in west Sweden and particularly Bohuslän. Small-seeded types with a 1000-grain weight of between 300 and 500 gm. are available, and recently breeding has been initiated at Svalöf with the object of producing high yielding small-seeded field beans.

Improved methods of cultivation and harvesting of leguminous crops should be introduced to bring about a reduction in the comparatively large labour requirement.—R.P.J.

DIMMOCK, F. **Soybean breeding at Ottawa.** *Soybean Digest* **8.** 18. 1948. **1078**

A brief review of the work done with soybeans at the Central Experiment Farm. Breeding work began in 1928, the main objectives being to develop early maturing high yielding varieties suitable for production in eastern Ontario and southern Quebec. A collection of the best material then available was secured, the earliest variety being Manitoba Brown. Others included Wisconsin Black, Mandarin, Ito San, Manchu, and collections from the U.S.D.A. and the Royal Botanical Gardens, England. No individual variety was found to be sufficiently desirable in agronomic characteristics. Mandarin tended to be late but individual plants within the variety varied sufficiently in this respect and many selections were made. By 1934 a selection, Mandarin (Ottawa) was named and it remains the most popular variety in eastern and central Ottawa.

Additional varieties were developed : In 1937, Kabott, 10 days earlier than Mandarin ; in 1939, Pagoda, 10 days earlier than Kabott. These three varieties, ranging in maturity from 100 to 120 days at Ottawa have greatly extended the area in which soybeans can be grown in Canada. A recent addition is Capital ; it is taller, earlier and slightly higher in yield than Mandarin. It originated from a cross between strain 171 × A.K. (Harrow) made in 1935. At present, final tests are being made on new strains which are believed to be superior to the older varieties already released —P.M.

HUMPHREY, L. M. **R. L. Dortch seed farms. 1947 variety test.** *Soybean Digest* **8.** 14-5. 1948. [Dortch Seed Fms, Scott. Ark.) **1079**

Results are given of tests of twenty-seven commercial varieties of soya beans. The soil on which the tests were carried out is fine sandy loam of average fertility ; 300 lb. of 3-9-18 fertilizer were broadcast on the land before final disking. Plants were in hills, 22 in. apart and thinned to one plant per hill ; rows were 38 in. apart and 60 ft. long. Harvesting was done by hand and threshing was carried out in a small portable power driven thresher. It is suggested that the figures quoted for yields should be reduced by 20 per cent to give results comparable to those that might be expected by combining and on soil of comparable fertility.

Highest yields were from mid-season and late varieties with large beans. Dortchsoy No. 31 and No. 2 (selections from the Ogden variety) gave the highest yields. The former is 3 weeks later in maturity than the latter. The summer was hot and dry and a high percentage of shattering occurred. Dortchsoy No. 7, a highly resistant variety, shattered considerably on land lacking in fertility, but on more fertile land, shattering was negligible. Weather conditions were ideal for studying varietal resistance to drought. Dortchsoy No. 31 and No. 2 showed a high degree of resistance and all 10 of the top ranking varieties showed from good to excellent resistance. Lodging was bad in varieties having a viney type of growth. A table in the article gives figures of yield, days to maturity, bean size and colour, lodging and shattering.—P.M.

ILLINOIS Agricultural Experiment Station. Bull. 520. **Lincoln—a midseason soybean for the North-Central States.** By *C. M. Woodworth* and *L. F. Williams*. 1947. 335-47. **1080**

The Lincoln soybean was developed by the Illinois Agricultural Experiment Station and the U.S. Regional Soybean Laboratory ; several other state experiment stations gave help in the experimental work. During a period of 5 years the average yield of this variety exceeded that of Mungo, Dunfield and Illini by 16 per cent ; it averaged a higher oil content than these three, and in resistance to lodging it is surpassed only by Richland. The seed quality is slightly higher than the commonly grown varieties ; the plant grows as high as Mungo, Mukden and Dunfield and matures about the same time as Mungo and Dunfield. It is well adapted to an area which produces three-quarters of the total soybean crop of the U.S.A.—P.M.

SHERWIN, H. S., LEFEBVRE, C. L., and LEUKEL, R. W. **Effect of seed treatment on the germination of soybeans.** *Phytopathology* **38.** 197-204. 1948. [Bur. Pl. Ind. and Soils and Agric. Engng. U.S.D.A., Beltsville, Md.] **1081**

Increases in germination from seed treatment were obtained more often at 25°C. than at any other temperature, thus temperature seems to have a significant effect on the response of some soybeans to seed treatment. Of the three fungicides used, Arasan improved emergence more frequently than did Spergon or New Improved

Ceresan. When seed was stored for one year after treatment, there was a greater increase in emergence over the check than in the case of treated seed planted soon after treatment but total emergence was less after storage.—P.M.

PENFOUND, W. T., and MINYARD, Virginia. **Relation of light intensity to effect of 2, 4-dichlorophenoxyacetic acid on water hyacinth and kidney bean plants.** *Bot. Gaz.* **109.** 231-4. 1947. [Univ. Oklahoma and Tulane Univ.] **1082**

In water hyacinth (*Eichhornia crassipes*) this phytocide was more effective in shade than in full sunlight. In kidney bean (*Phaseolus vulgaris*) nearly all plants died within 7 days whether in darkness, diffuse light or sunlight, but those in sunlight had a better chance of survival. Kerosene was the carrier used for the phytocide: it was very satisfactory because of the rapid spreading of the droplets and penetration of plant tissues. —D.B.

SMITH, F. G. **The effect of 2, 4-dichlorophenoxyacetic acid on the respiratory metabolism of bean stem tissue.** *Plant Physiol.* **23.** 70-83. 1948. [Univ. Rochester Medical Center, N.Y.] **1083**

The changes in respiration of *Phaseolus vulgaris* treated with 2, 4-D included changes in rates of oxygen intake and evolution of carbon dioxide; these were correlated with histological changes and with changes in sugar and starch content and in nitrogen content. The effect of respiratory inhibitors, particularly iodoacetate, was studied.

The work is based on the hypothesis that "auxins control growth by affecting respiratory processes which furnish the energy and/or building units for the synthesis of cellular constituents". The question is discussed whether the changes in the respiratory mechanism resulting from auxin stimulation are the cause or the result of the growth response.—D.B.

MAINE Agricultural Experiment Station. Bull. 431. **The Mexican bean beetle in Maine.** By *J. H. Hawkins*. 1944. 205-31. **1084**

A description of the Mexican bean beetle, its eggs, larvae and pupae and the type of injury caused to beans by the adult beetle and the larvae is given. Those insecticide materials which have proved satisfactory in Maine are calcium arsenate, cryolite and rotenone. Calcium arsenate should be used only when combined with magnesium hydrated spray lime. Cryolite is effective in the control of the bean beetle, but, as in the case of calcium arsenate, beans treated after the pods are formed should not be used as food unless it is certain that harmful residues have been removed. Rotenone can be used after the pods have formed as it is not injurious to humans or domestic animals. The value of removing refuse such as grass, bean stalks and weeds to prevent the beetles hibernating, is stressed.—P.M.

ARMITAGE, H. M. **The Mexican bean beetle in California.** *J. econ. Entomol.* **40.** 865-9. 1947. [Calif. Dept. Agric.] **1085**

An account of the discovery of the Mexican bean beetle found infesting lime beans in Ventura County in July, 1946, and of the measures taken by federal, state and county agricultural authorities in an attempt to eradicate the advanced infestation.—P.M.

POOS, F. W., GRAYSON, J. M., and BATTEN, E. T. **Insecticides to control tobacco thrips and potato leafhopper on peanuts.** *J. econ. Entomol.* **40.** 900-5. 1947. [U.S.D.A., Agr. Res. Adm., Bur. Entomol. and Plant Quarantine (F.W.P.) and Virginia Agric. Exp. Sta. (J.M.G. and E.T.B.)] **1086**

Using hand-operated equipment, tobacco thrips were satisfactorily controlled on seedling peanuts with 3 (in some cases fewer) applications of formulations containing DDT. An emulsion containing 4 per cent DDT applied by atomization at the rate of 10 gal. per acre, gave the best results. Differences in yield at the time of harvest between treated and untreated plots were significant on soils of low fertility. DDT residues on hay samples collected at the harvest in 1946 did not exceed 4.5 p.p.m. except where additional applications of a dust containing 2 per cent DDT in pyrophyllite had been made in July and August to control potato leafhoppers.

Satisfactory results were obtained against the potato leafhopper with concentrations of DDT as low as 1 per cent in sulphur applied three times at 3-week intervals during July and August at a rate of 20-25 lb. per acre. Highest amount of DDT on hay samples was 28.3 p.p.m. after 3 applications of a dust made from a fused mixture containing 5 per cent DDT in sulphur. Residues at harvest time on plants treated with 3 applications of sulphur mixtures containing 1 and 2 per cent DDT were not in excess of 4.5 p.p.m.—P.M.

THORNTON, G. D., and BROADBENT, F. E. **Preliminary greenhouse studies of the influence of nitrogen fertilization of peanuts on nodulation, yield, and gynophore absorption of this element.** *J. Amer. Soc. Agron.* **40.** 64-9. 1948. **1087**

The first experiment was to determine the effects of nitrogen fertilization on inoculated peanuts growing in a nitrogen deficient soil. When nitrogen was applied at the time of planting nodulation on the peanut seedlings was reduced and there was an increase in nitrogen content. Except when a light application was made 5 weeks after planting, the combined yield of vine and peanuts was increased as a result of the fertilization. When 6 to 12 p.p.m. of nitrogen was applied, either at the time of planting or 5 weeks afterwards, there was a higher percentage of mature nuts at the harvest.

The second experiment was to employ isotopic nitrogen as a means of studying nitrogen absorption through the peanut gynophores when varying nitrogen levels existed in the rooting zone. It was established that a definite correlation exists between the amount of nitrogen taken in through the gynophores and the available nitrogen supply in the rooting zone. When nitrogen was in ample supply in the rooting zone absorption through the gynophores was very slight. When there was a deficiency of nitrogen in the rooting medium, considerable absorption took place through the gynophores.—P.M.

Ivanoff, S. S. **Chlorosis and nodulation of cowpeas as affected by trial sulphur applications to calcareous soil in the greenhouse.** *Plant Physiol.* **23.** 162-4. 1948. [Texas Agric. Exp. Sta., Substation 19, Winter Haven] **1088**

The highly calcareous soils along the Nueces River in S. Texas are unfavourable for *Vigna sinensis* and other legumes because of lime-induced, non-infectious chlorosis. Plants which received additions of sulphur did not suffer from chlorosis: they were tall, stout and green and had abundance of large nodules, whereas plants growing in non-treated soils were extremely chlorotic.

It is not known whether the improved condition of plants growing in sulphur-treated soil is due to the action of sulphur on the rhizobia and their environment or to the better growth induced by a minor element made available by sulphur.—D.B.

OIL CROPS

Andersson, G. Svensk oljeväxtodling under fredstid. [**Swedish oil crop cultivation during peace time.**] *Svensk Jordbr. Forskn. Årsbok* 1947. 77-86. 1947. **1089**

In Sweden in 1940 the area sown with oil crops (autumn rape, poppy, oil flax, soya and white mustard) was 400 ha., and in 1941 approximately 8000 ha.; by 1944 it had increased to 44,000 ha. In 1945 and 1946 there was a decline in oil crop cultivation; the area in 1945 was 37,000 ha. and in 1946 it had decreased to 27,500 ha. Breeding work with oil plants is in progress and improved Svalöf varieties of autumn rape, spring rape and oil flax have come on the market; new, still better varieties of autumn rape, spring rape and oil flax are undergoing multiplication. For oil crop cultivation in peace time an area of 40,000 ha. would be appropriate.—R.P.J.

КОНЮКОВ, И. Размещение производства масличных культур в новой пятилетке. *Соц. Сельс. Хоз.* 1947. *No.* 3. стр. 24-33.

Konjukov, I. [**Oil-crop production, and its disposition in the new 5-year plan.**] *Soc. seljs. Hoz.* 1947. No. 3. pp. 24-33. **1090**

This work is from the Proceedings of the Conference on distribution of agriculture, Institute of Economics, USSR Academy of Sciences. In regard to the location of oil-crop production, it is necessary to bear in mind two aspects of the problem: firstly, the industry utilizes only part of the supply of raw material; and secondly, the consumption of plant fats by the whole community of USSR should be more popularized. Cultivation of oil crops in the Union is unequally distributed, and those of the collective farms are varied, comprising *Helianthus annuus*, *Linum* sp., *Brassica* spp., *Ricinus*, *Camelina*, *Arachis*, *Soja*, *Lallemantia*, *Perilla*, *Sesamum*, *Carthamus tinctorius*, and *Papaver*. Compared with the pre-revolution period, the sown area of sunflower (the most important oil crop of the Union) has increased greatly in the Ukraine and eastern regions, while the importance of this crop has declined in the Voronež and Saratov provinces and in the Krasnodar territory. In studying the possibilities for extending sowings of sunflower it is concluded that improved agrotechnical methods would obviate the low yields from some areas considered unsuitable for this crop. Information on fluctuations in size of sown areas and consequent variation in yields of the above crops are recorded. Flax, for example, up to the time of the war was primarily concentrated in the Ukraine, but in the post-war period Uzbekistan and Tadžik SSR are increasing in importance for unirrigated flax growing.

Economic aspects of oil production from plants are considered, with special reference to oil yields per hectare and fat consumption per person, per day.

A table gives indication (in centners per ha.) of oil production in the various provinces from sunflower, *Ricinus*, oil flax, *Brassica* (mustard), *Camelina*, winter rape, *Arachis*, *Glycine*, *Sesamum*, *Carthamus*, *Perilla*, and *Lallemantia*.—M.H.

Elías (Brother). Plantas oleaginosas cultivadas o que crecen espontáneas en Venezuela. [**Oil plants cultivated or growing wild in Venezuela.**] 3a Conf. Interamer. Agric. Cuad. verd. No. 54. 1946. pp. 67. pls. [Escuelas Cristianas, Venezuela] **1091**

This brochure is concerned with 35 oil plants, cultivated or growing wild in Venezuela, and the list is still far from exhaustive. A short botanical description is given of each, together with information on habitat, cultivation, and yield. Although approximately 4000 tons of edible oils and fats are produced annually in Venezuela, an almost equal quantity is imported, and there is ample opportunity for an intensification of oil plant cultivation. —G.M.R.

ENGLAND AND WALES, Ministry of Agriculture and Fisheries. "Growmore" Leafl. No. 13. **Home-grown linseed.** [1947] pp. 4. **1092**

Linseed, a crop for cool humid conditions, should be sown in the latter half of March. The seedlings can withstand considerable frost and by sowing early the danger that the seedlings will be checked by a spring drought is avoided. Delayed sowing also involves the further risk of damage by flea beetles. Broadcasting does not give results equal to drilling; the germination is more uneven and much heavier seed rates are required for a good take. Leatherjackets and flea beetles can be effectively killed by a poison bait dressing of Paris Green (1 lb. mixed with 25 lb. of moistened bran per acre) scattered thinly over the affected area. The new varieties Royal, Redwing and Bison should be chosen in preference to the older and late ripening types like La Plata or Plate. Besides earliness and productivity, the new varieties are more uniform in habit of growth and ripening.—G.M.H.

BURMANN, F. W. **Linseed.** *J. Minist. Agric.* **54.** 535-8. 1948. **1093**

Comments on methods and experience with linseed and tabulated details of three linseed crops grown on the outskirts of the Chiltern Hills. The variety Redwing was used, sowing being at the rate of 60 lb. per acre in field A and 80 lb. per acre in fields B and C. Yields per acre were 11 cwt., 8 cwt., and 16 cwt. for fields A, B and C respectively. A firm seed bed to bring subsoil moisture to the seed and ensure a high germination rate is important. Threshing should not be attempted until the crop is really well-dried.—G.M.H.

BJÖRKLUND, C. M. Erfarenheter från årets försöksverksamhet med oljeväxter. [**Results obtained in the trials with oil plants conducted in 1947.**] *Svensk Frötidn.* **17.** 37-9. 1948. **1094**

In eight so-called species trials conducted in Scania the average yield of oil flax was 1600 kg. per ha., of white mustard 1510 kg. and of spring rape only 910 kg. In 1946 white mustard gave the highest yield. In species trials in the whole country white mustard gave the highest yield followed by oil flax. Oil flax gave the highest yield on clay soils, white mustard and spring rape grew best on lighter soils.

In variety trials with oil flax Svalöf pure bred has given the highest yield of the varieties hitherto placed on the market. Svalöf is to release shortly a new flax variety, Valuta, which in trials has given a yield approximately 8 per cent higher than that of the pure bred flax. A Finnish variety, Vaanila, has in trials given a 4 per cent higher seed yield than the pure bred. Concurrent in the Scanian trials was inferior to pure bred oil flax by 20 per cent; in Middle Swedish trials by only 6 per cent. Svalöf Valuta has given 15 per cent more crude fat than pure bred oil flax.

With oil flax the earliest sowing (mid-April) has given the highest yield. With later sowing dates, provided these are not later than the beginning of May, differences are not great. Sowing during the latter part of May and particularly in June gave very poor results. The oil content in the flax seed falls markedly with late sowing, while the crude protein content rises. With white mustard also the highest yield was obtained from the earliest sowing. When sowing was carried out as late as May-June the seed yield was reduced by half; the oil content also decreased. White mustard appears to be more susceptible than flax to postponement of sowing date.

Rate of seeding of flax has little effect on size of yield. In many trials as low a rate as 40 kg. per ha. has proved adequate. A rate of seeding above 80 kg. did not give a higher yield.

Differences in yield with different drill spacing were in general very small. The tendency noted in the trials is that white mustard gives the highest yield with a drill spacing of 22 to 33 cm., and spring rape with a spacing of 44 cm. Oil flax appears to give the highest yield with the usual drill spacing, that is 11 cm. Drill spacing has had little effect on oil content and crude protein content of the seeds.

Increasing the nitrogen dose from 400 to 600 kg. calcium nitrate increased the yield of white mustard seed by 160 kg. and of spring rape seed by 130 kg. per ha. Further increase from 600 to 800 kg. has raised the yield by only 30 and 90 kg. per ha. respectively.

In Scania 200 kg. calcium nitrate applied to oil flax increased the yield by 130 kg. seed per ha., while raising the amount from 200 to 300 kg. increased the yield by only 40 kg. per ha. With the application of 200 kg. calcium nitrate no increase in yield was obtained, but on the average a slight decline was noted.

Trials with hormone derivatives to combat weeds in a few oil flax trials indicated that this method of control will prove successful. It is important that concentrations should not be too strong and that spraying should not be carried out too late. Fibre flax should not be sprayed with hormone derivatives.—R.P.J.

FINA, A. L. de, and SORDELLI, D. A. Notable modificación del grano del lino oleaginoso registrada dentro de un area reducida. [**Remarkable modification in the grain of oil flax recorded in a small area.**] *Rev. Fac. Agron. La Plata* **26.** 5-27. [English summary, p. 27.] 1946. [Lab.

Bot. "Carlos Spegazzini," Min. Agric., Buenos Aires] **1095**

The authors present and analyse data on yield, housand grain weight and oil content of linseed f the varieties 330 M.A. and H.39 M.A., sown nonthly from April 22 to September 24, 1937, n the grounds of the Facultad de Agronomía y Veterinaria, University of Buenos Aires. Although he area sown was only 48 m. × 84 m., a remarkable modification in the characters studied was bserved.

In the second part of the article, total correlaion between the different pairs of the three haracters considered is studied for each variety; partial correlation is also studied, keeping constant for each pair of variables the influence of the third variable.—Authors' summary, trans. H. G. Fisher.

CULPIN, C. **Linseed harvesting and thrashing.** *Agric. Engng. Rec.* **2.** 76-9. 1948. **1096**

Successful linseed harvesting depends largely on having an uniform crop and so it is essential to prepare a fine firm seed bed and to drill the seed evenly. Harvesting by binder and by combine harvester is described, though it is pointed out that for small areas a mower may be used. The crop must not be run over, for although shaking has little effect the slightest pressure will cause shelling.

The crop must be perfectly dry and the machine in good order for satisfactory threshing. A thrasher that does not produce a clean sample of corn or spills it from various places through wear and neglect will not thrash linseed properly.—G.M.H.

FIBRE CROPS

UNITED NATIONS, Food and Agriculture Organization. **World fiber survey.** pp. 198. Washington, 1947. **1097**

This book was prepared between April and mid-July, 1947, primarily in order to provide "factual background" for the decisions of the Third Session of the Conference of the Food and Agriculture Organization of the United Nations, which was held in Geneva in August and September of that year. It reviews some of the basic factors influencing the production of natural fibres (cotton, wool, silk, flax, hemp, jute, abaca, sisal, henequen) and artificial fibres (rayon filament yarn and staple fibre, casein, soybean, groundnut, zein, keratin and albumin fibres, nylon, etc.), consumption and trade, and the current fibre situation. The World Fiber Survey is a most valuable reference book, despite the limitations imposed on Dr. Gerda Blan and the members of her staff by incomplete statistical records for the war and immediate post-war year.—G.M.H.

DORASAMI, L. A., and IYENGAR, G. S. **American cottons. Their cultivation and breeding in Mysore.** *Indian Cott. Grow. Rev.* **2.** 9-16. 1948. [Dept. Agric., Mysore]
[See *Plant Breeding Abstracts.*] **1098**

ИГНАТОВ, В. Социалистическое хлопководство в новой пятилетке. *Соц. Сельс. Хоз.* 1946. *No.* 12. стр. 22-5.

IGNATOV, V. [**Socialist cotton production in the new 5-year plan.**] *Soc. seljs. Hoz.* 1946. No. 12. pp. 22-5. **1099**

The new 5-year plan envisages a considerable development in cotton growing in the USSR, the aim being to secure at the end of the period a total crop of raw cotton of 3.1 million tons with a yield of 18.4 centners per ha. Even during the war years high yields were obtained: in 1945 kolhozes in the Taškent province showed an average yield of raw cotton amounting to 21.4 centners per ha., while yields of up to 128 centners per ha. have been obtained in the case of irrigated crops.

The plan provides for further mechanization of the various cultural processes. By 1950 the projected store of mineral fertilizers will permit farmers in the cotton-growing districts to count on obtaining 200-215 kg. of nutritive substances for each hectare sown or twice the amount available in 1940.

Rapidly growing sowings of fodder crops and the increase of cattle breeding in the cotton growing districts augment considerably the supply of dung. The introduction of suitable rotations including the utilization of seeds mixtures of lucerne and grasses (cocksfoot, ryegrass, etc.) is a matter of great urgency. In regions where cotton is grown under irrigation 7- to 10- course rotations are adopted. In planning rotations for individual districts, such as the areas of lucerne seed production in the Uzbekistan and Turkoman SSR, the requirements of seed production of this plant must be taken into account. The importance of breeding varieties of cotton which would mature 5 to 10 days earlier than those at present available is stressed.—R.P.J.

YEHIA, M. A. G. **Cotton—the basis of Egypt's wealth.** *Bull. Egypt. Educ. Bur.* No. 24. 10-7. 1948. **1100**

Egyptian cotton ranks the highest grade in the world (excluding the best Sea-Island varieties) with a staple ranging between 1-1.5 in. The yearly crop, ranging between 5.5-7.5 million kantars (1 kantar of cotton = 315 lb.), accounting for 10-12 per cent of world production. The crop is planted in Upper Egypt about the latter half of January and in Lower Egypt between February 15 and March 15. Harvesting, which is done exclusively by hand, commences about the first week in September. There are usually three separate pickings since all pods do not open at the same time. The farmer thus has an opportunity of marketing the first picking (undoubtedly the best) at a good price and makes it easier to obtain purer cotton seeds.

Weighing about 65 per cent of the crop, the cotton seed provides important by-products. Valuable oils are extracted and used in the production of vegetable fats and soap; cotton seed oil extracted in Egypt forms an important part of the staple diet of the majority of the Egyptian people. The cake remaining after crushing the seed forms a valuable animal fodder and contains digestible proteins which vary in quantity from 30 to 40 per cent of the cake.—G.M.H.

TROUGHT, M. T. La culture du coton au Soudan Anglo-egyptien. [**Cotton cultivation in the Anglo-Egyptian Sudan.**] *Cot. Fib. trop.* **2.** 67-74. 1947. **1101**

In Anglo-Egyptian Sudan cotton is cultivated in four principal regions: Gezira, the delta of the Gash, the Tokar region and on the Nubian mountains. In the three first zones cotton is of the Egyptian type; in Nubia an American cotton is cultivated.

The system of cultivation in Gash and Tokar is almost unique as it utilizes the water of torrents which are dry but for a few months of the year. The river Gash has never reached the Red Sea, it inundates and fertilizes the plain north of Kassala where it is completely absorbed. The river Baraka, which gives irrigation water in the Tokar zone, flows into the sea thus losing part of its slime. Maybe it is due to this reason that the cotton of Tokar is inferior to the çotton of Gash, although it is cultivated in the same way.

In the Nubian mountains rainfall is sufficient and cotton is grown by the natives in individual plots and sold in the markets.

The cotton production of Gezira is by far the most important. Rainfall being insufficient, the waters of the Blue Nile are utilized to irrigate a zone about 100 miles long and 30-40 miles wide along the west bank. Irrigation and cultivation are under the control of the Government. Measures are in force to fight against cotton diseases and noxious insects. The cotton is grown in rotation with millet and loubia (an African bean, *Dolichos lablab*) and two years of fallow land precede the cotton cultivation. It has been found that loubia is favourable to the multiplication of a fly, *Bernisia gossypiperda*, which is a vehicle of propagation of a cotton disease. The first half of August is the best period for sowing. At the middle of October when the rainy season ends, irrigation is started and it continues until the end of March. There is an agreement with Egypt to cease irrigation in the Sudan at the beginning of April, after which date the water of the Nile is utilized for irrigation in Egypt.—E.B.

AFZAL, M. **Cotton growing in the Sudan.** *Indian Cott. Grow. Rev.* **2.** 1-8. 1948. [Cotton Res. Lab., Lyallpur] **1102**

Both Egyptian and American varieties of cotton are now being grown in different parts of the Sudan. The American types are cultivated in the Kordofan and Equatorial Provinces and are entirely rain-fed; Egyptian cotton is grown in the Gezira plain under perennial irrigation, and in the Gash and Tokar deltas by floodwater. Irrigated Egyptian cotton is the most important source of wealth in the Sudan, most of which is grown in the Gezira plain. In this plain, Sakel and X1730 A are the varieties grown, Sakel in the northern half and X1730 A in the south. These two varieties are also grown in the Gash. Sakel suffers badly from leaf-curl in the Tokar and only X1730 A is grown. The American variety 'Pump Scheme' is grown in the Kordofan while the varieties XA129 and 511 D are grown on the east and west banks of the Nile respectively in Equatoria. No cotton is at present being grown on the east bank.—G.M.H.

PATIL, A. S. **Cotton improvement in the Bombay Karnatak.** *Indian Cott. Grow. Rev.* **2.** 31-4. 1948. [Dept. Agric., Bombay Province] **1103**

An account of the schemes whereby the two new strains, Jayawant and Gadag No. 1, isolated from the material of local Kumpta and Dharwar-American cottons, are being extended throughout the Bombay Karnatak.—G.M.H.

BURNETT, L. C., and REDDY, C. S. **Farming with flax.** *Iowa Fm Sci.* **2.** 3-4. 1948. [Res. Prof. Fm Crops and Res. Assoc. Prof. of Bot. and Pl. Path., Iowa St. Coll.] **1104**

Some flax has been grown in Iowa, ever since the prairie sod was first broken. In 1948 the acreage target is 195,000 acres, of which some 70 per cent will be in the north-western part of the state. Apart from its value as a cash crop, flax is a good companion crop for alfalfa and clover, giving the right amount of shade for legumes.

It is suggested that best yields are obtained by sowing early (before mid-April) and by using treated seed. Seed should be treated with 1 to 1.5 ounces per bu. of New Improved Ceresan. Pythiaceous fungi are the soil inhabiting parasites that attack seedlings. These organisms attack non-treated seed through any break in the wall. Suggested varieties for Iowa are Dakota and Kato and the early variety Redwing. Although Minerva is an excellent light-seeded variety, yielding well in grade and quantity of oil, it is very susceptible to disease. Information is given on fertilizer requirements and herbicide sprays.—P.M.

ДМИТРИЕВ, А. Дефолиация (удаление листьев) хлопчатника как условие механизированной уборки. *Соц. Сельс. Хоз.* 1946. *No.* 9. стр. 57.

DMITRIEV, A. [**Defoliation (removal of leaves) of the cotton plant as a condition of mechanical harvesting.**] *Soj. seljs. Hoz.* 1946. No. 9. p. 57. **1105**

In the U.S.A. dusting of cotton plants with calcium cyanamide has given good results. Defoliation in plantations of tomatoes accelerated ripening of the fruits and improved their quality.

Mechanization of harvesting of cotton has a great future in the USSR. Detailed study of the question of defoliation of the plant is an absolute necessity.—R.P.J.

GREEN, R. E. L. **King cotton goes mechanical.** *Res. and Fmg* **6.** 8-10. 1948. (Assoc. Prof. Agric. Econ. N. Carolina Agric. Exp. Sta.) **1106**

Cotton was first harvested by machine in North Carolina in 1945. In the following year 3 mechanical pickers and 4 stripper-type machines operated in the State, harvesting 380 bales from 431 acres (about one-tenth of 1 per cent of the total 1946 crop.) In 1947 the Department of Agricultural Economics undertook a study of mechanical harvesting. The height of the cotton harvested by pickers averaged 40 inches. Between 84 and 87 per cent of the open cotton was harvested after one operation. When a second run was made, 98 per cent of the cotton was gathered. Picking was carried out at the rate of eight-tenths of an acre per hour, and where the cotton was relatively free from weeds, the grade compared favourably with the hand-picked product.

The stripper-type covers two rows at a time and harvests about 1 acre per hour, gathering approximately 90 per cent of the total yield, consequently all bolls must be open before harvesting can be attempted. Cotton picked with the stripper must be ginned by a modern type gin equipped especially to handle it.

Some observations and suggestions are made for the use of mechanical pickers: (1) for best results, there must be adjustments in other steps of cotton production; (2) the picker does not operate successfully where the slope is so steep that the rows run on the contour; (3) strippers do not harvest successfully when plants are more than 36 inches tall. This can be overcome by spacing the cotton more thickly within the row, developing a variety which will produce a smaller plant without reducing yield and developing a stripper that will handle larger plants; (4) picker and stripper sometimes pick up stones when harvesting the lower bolls; this could possibly be overcome by developing a plant whose lowest bolls are higher above the ground.—P.M.

MONTHLY REPORT OF THE MINISTRY OF AGRICULTURE NORTHERN IRELAND. **Flax in Northern Ireland—cost of production.** *Mon. Rep. Minist. Agric. N. Ire.* **22.** 325-8. 1948. **1107**

Results of an investigation carried out during 1944, 1945 and 1946 in all six counties into the costs of producing dam-retted flax. The tabulated summary shows average cost per acre for growing, harvesting and marketing in the three years under consideration. Growing costs were £5 15s. 7d., £5 13s. 0d. and £5 1s. 11d. respectively, harvesting costs £10 14s. 5d., £9 18s. 0d. and £12 6s. 11d. respectively, and marketing costs £9 17s. 4d., £10 2s. 0d., and £13 2s. 9d. respectively. Records obtained in 1946 from 10 farms on which green flax was produced show the average cost of growing as £6 5s. 3d. per acre, of harvesting £7 0s. 6d. and marketing £2 15s. 10d.—G.M.H.

REITZ, C. P., HANSING, E. D., DAVIDSON, F. E., and DECKER, A. E. **Viability and seed treatment of flax.** *J. Amer. Soc. Agron.* **39.** 959-70. 1947. [Kansas Agric. Expt. Sta.] **1108**

Some of the causes of low germination in *Linum usitatissimum* were investigated, using Kansas-grown flax seed. The average viability of samples was determined for 12 crop years, and comparative germination tests were conducted with the varieties Linota, Bison, Redwing and Viking. Among the factors which influenced the viability of the seeds were the weather conditions during ripening and harvesting, the method of harvesting and degree of mechanical injury. Differences were noted between varieties, and Redwing and Linota seed gave the highest percentages in germination tests. The effects of treating the seed on the emergence and subsequent yield were studied. New Improved Ceresan, DuBay 1452-F, Arasan, Spergon and Phygon all improved emergence, but the yellow-seed varieties responded more effectively to treatment than did the brown-seed varieties such as Linota and Redwing. Significant increases in yield were obtained by applying 1 oz. per bu. of New Improved Ceresan to the flax seed before planting.—M.E.E.

ДЕМКИН, А. П. За высокий урожай семян конопли. *Совет. Агрон.* 1947. *No.* 4. стр. 39-44.

DEMKIN, A. P. [**High yields of hemp seed.**] *Sovet. Agron.* 1947. No. 4. pp. 39-44. **1109**

Means by which increased yields may be achieved include: (1) use of fertilizers (large quantities of NPK are required, and mineral fertilizers give good returns in seed and fibre yields); (2) sowing 20 to 30 kg. seed per ha. in drills with 60 cm. between drills and 12.5 cm. between rows; and (3) cultivation of the soil. The following data from the Hemp Institute indicate the yields of seed in centners per hectare as determined by the number of inter-row cultivations, in 1938 :

Number of cultivations	Gluhov, Sumsk region	Karačev, Orlov region
Two	5.65	7.43
Three	5.96	8.92
Four	6.40	8.88
Five	7.66	11.18

—M.H.

DELATTRE, R. Insectes du colonnier nouveaux ou peu connus en côte d'Ivoire. [**New or not well-known insects of the cotton-plant on the Ivory Coast.**] *Cot. Fib. trop.* **2.** 97-100. 1947. **1110**

Bemisia Gossypiperda (or *Bemisia Tabaci*) transmits the virus which is the cause of the "leaf-curl" of the cotton plant. A number of plants are host for *Bemisia* : amongst these there are many weeds which should be destroyed as far as possible; others are cultivated plants, e.g. *Dolichos lablab*. These cultivations should be kept at a sufficient distance from the cotton-plants. It is only in the research of a variety resistant to "leaf curl" that the problem can be solved.

The "pink worm," *Platyedra Gossypiella*, is a cause of serious losses in cotton. As the infection is propagated by larvae in the seeds, these should be disinfected. It is also advised to burn the remainings of cotton-plants, after the cotton has been collected, as they are known to maintain the infection.—E.B.

OKLAHOMA Agricultural Experiment Station. Circ. C.126. **Comparative effectiveness of various insecticides and methods for controlling cotton insects.** By *C. F. Stiles* and *F. A. Fenton.* 1947. pp. 4. **1111**

Dusting is the only method which gives good control of all cotton insects, with the materials and equipment now generally available. Leafworms, however, can be controlled by spraying. Short notes are presented on the comparative effectiveness of benzene hexachloride, calcium arsenate, chlorinated camphene, chlordane, parathion, DDT, nicotine and sulphur.—P.M.

NORTH CAROLINA Agricultural Experiment Station. Ext. Circ. 312. **Cotton insect control in North Carolina.** By *J. T. Conner* Jr., and *W. M. Kulash.* 1948. pp. 7. **1112**

Apart from recognized farm practices which aid the cotton farmers in combatting insect pests, the use of chemical insecticides is advocated. Calcium arsenate gives excellent weevil control when applied undiluted at 7 to 10 lb. per acre; unfortunately, when used alone, aphids tend to increase, but the addition of nicotine to the calcium arsenate prevents aphids. Should red spiders develop, calcium arsenate may be mixed 50-50 with dusting sulphur. Calcium arsenate does not control cotton fleahopper, cotton aphid, red spider, tarnished plant bug or rapid plant bug.

Benzene hexachloride has been used against the boll weevil, cotton aphid, cotton leafworm, cotton fleahopper, thrips, tarnished plant bug and rapid plant bug. Applications should be 4 to 5 days apart at rates of 10 lb. benzene hexachloride dust containing 3 per cent gamma isomer. If benzene hexachloride is used alone, serious infestations of red spider may develop. A mixture of 3 per cent gamma isomer benzene hexachloride, 5 per cent DDT and 40 per cent sulphur will control not only red spider, but also the boll weevil and bollworm.

Chlorinated camphene, a new organic insecticide, should be applied at 10 lb. of a 20 per cent dust per acre. This gives control of the boll weevil, bollworm, cotton fleahopper, cotton leafworm, tarnished plant bug, rapid plant bug and thrips. To control red spider, 40 per cent sulphur should be added to the chlorinated camphene.

Short notes are given on dusting, equipment and precautions to be observed.—P.M.

UNITED STATES, Department of Agriculture. Tech. Bull. No. 948. **Cultural practices as related to incidence of cotton root rot in Texas.** By *H. V. Jordan, J. E. Adams, D. R. Hooton, D. D. Porter, L. M. Blank, E. W. Lyle* and *C. H. Rogers.* 1948. pp. 42. **1113**

Cotton root rot is the most destructive disease of cotton in the south-western United States. The development and distribution of suitable heavily constructed, deep tillage equipment have revived the possibilities of deep tillage as a control measure for the disease. Experiments have demonstrated that deep tillage is very effective in reducing losses caused by the disease, in the year which follows the tillage. The effects did not persist for succeeding years, thus the heavy costs involved in this practice limits its possibilities unless cheaper means can be found to carry out the operation annually. Trends in the experiments led to the investigation of cheaper tillage methods.

Fourteen experiments in deep tillage were carried out over 6 years. The standard method of subsoiling twice and chiseling was employed. Results indicated that such methods would have to be employed as an annual measure. Repeated tillage over a number of years reduced losses from root rot, but there was evidence of plant unthriftiness. It appeared that chiseling was almost as good as subsoiling and chiseling together. The cheapness of the former measure would appear to justify its use.

In a 10-year study, ploughing in early autumn produced definite reductions in the amount of the disease ; better results were obtained with deep tillage combined with applications of manure, sorghum or straw. The greatest reduction in the amount of disease and increasing of the yields was obtained by the deep placement of manure in trenches. Maximum results from autumn ploughing were obtained when the operation was carried out under dry conditions.—P.M.

FREDERIKSEN, P. S. Hørrustens Udbredelse, Skadevirkning og Bekaempelse. En Fare for vor Spindhørdyrkning ! [**Distribution, harmful effect and control of rust of flax. A danger to Danish fibre flax cultivation.**] *Ugeskr. Landm.* **93.** 275-9 and 291-4. 1948. **1114**

Tabulated data show the distribution of rust in different parts of Denmark during the years 1942-1946. Rust attack has varied greatly from district to district. North Sealand has in all the years had few and slight attacks, while north, west and south Jutland have suffered severely. The difference is mainly due to climatic and soil conditions. In central and south-east Sealand there has been a uniform increase in the dissemination of rust during the 5 years : this would appear to be due to the extensive use in these regions of fibre flax crops as cover crops for seed plots. Ploughing of the flax stubble is prevented, and rust-attacked straw overwinters and transmits the disease to the next year's crop. High June rainfall in the years in question has also favoured an increase of the disease.

Rust rarely appears in Denmark before 1 July, so that it is necessary for the flax crop to be as near maturity as possible before the disease manifests itself. Effective cultivation measures include sowing fibre flax crops at as great a distance as possible from the previous year's flax crops, sowing as early as conditions permit, sparse application of nitrogenous fertilizers, and liberal manuring with potash. Cultivation on low and humus-rich areas is to be avoided. Even in a dry summer fibre flax on marshy ground may be ravaged by rust.—R.P.J.

BATALLANEZ, R. H. Presencia de la " antracnosis " del lino en la República Argentina. [**Presence of anthracnose of flax in the Argentine Republic.**] *Publ. Est. Exp. Pergamino* No. 23. pp. 34. [English summary, pp. 30-1.] pls. 1947. [Est. Exp. Pergamino, Argentina] **1115**

Anthracnose of flax produced by *Colletotrichum lini* (Westerdijk) Tochinai was first observed in Argentina in 1943, and the fact that only foreign varieties grown on experimental farms have been affected suggests that it has been introduced in seed samples. Its limited dissemination is perhaps due to adverse environmental factors. A study of the disease is presented, with an account of inoculation tests. Methods of control used in other countries are enumerated in order that any outbreak may be suppressed on appearance.—G.M.R.

VARADA RAJAN, B. S., and PATEL, J. S. **Seed transmission of stem-rot of jute and its control.** *Indian J. agric. Sci.* **16.** 193-206. 1946. [Jute Agric. Res. Lab., Dacca] **1116**

Evidence is furnished for transmission of the disease, caused by *Macrophomina phaseoli*, through the seed of *Corchorus* spp. Repeated observations were carried out over a number of seasons on the mode of seed infection, and various techniques were tested for the detection of diseased seed. The effects of seed-borne infection on the germination of jute were studied and gravitational, heating and chemical methods were employed for the elimination of infection. For destroying the pathogen without affecting the viability appreciably, heating the seeds in water proved more useful than heating them in air. The zone for effective treatment was between 55° and 60°C., but deeply located schlerotia may survive even at 70°C.

Ceresan, Nomersan and Agrosan G proved effective as seed disinfectants, but the latter was not as effective as the other two in preventing seedling rot. From results of these experiments it is suggested that the role of the seeds in the initiation of this disease of jute is more important than that of the soil.—M.E.E.

PEARSON, Norma L. **Observations on seed and seed hair growth in** *Asclepias syriaca* **L.** *Amer. J. Bot.* **35.** 27-36. 1948. [Bur. Pl. Ind. Beltsville, Md.] **1117**

Milkweed (*A. syriaca*) has industrial importance because the floss is used as a substitute for kapok when this latter product is unobtainable. The developmental history of the seed and of its hairs which form the seed " coma " should have an important application when the weed is definitely cultivated for its floss.

Development of embryo sac and endosperm are described. The coma consists of hairs which are epidermal cells. " The age at which the coma-producing cells begin to elongate varies somewhat but appears to take place in pods of average development when they are 6-8 days of age. Elongation is not initiated simultaneously by all the cells of the coma-producing area but progressively from centrally located ones outwardly. This results in a tapering tuft whose inner or first formed hairs are the longest. The hairs continue to elongate for about 26 days, maximum length being reached by at least the thirty-fourth to thirty-fifth day after pollination and approximately at the same age at which maximum pod length and seed length are reached.

" A hair appears to maintain the shape which characterizes the matured one, that of a greatly elongated cone, throughout its growing period. Diameter changes of these elongating cones were demonstrated by changes in the width (diameter) of the hair bases. This dimension increases as the hairs grow in length. Maximum basal width is reached at least 34 days after pollination and thus approximately at the same age at which floss, seed and pod reach their maximum lengths. Secondary wall deposition begins at about the thirty-first to thirty-third day after pollination at which time the hairs have ceased to grow, at least appreciably, in length and breadth."—D.B.

Panse, V. G., and Khargonkar, S. A. **Effect of seed quality on yield of cotton.** *Indian Cott. Gr. Rev.* **2.** 17-22. 1948. [Inst. Pl. Ind., Indore] **1118**

Investigations on the physiologic and genetic aspects of size of seed on germination, plant vigour and yield in both *desi* (*Gossypium arboreum*) and American (*Gossypium hirsutum*) strains of cotton have shown conclusively that germination is improved and more vigorous seedlings produced by the sowing of large, heavy seed. The initial vigour persists during the later growth and is finally reflected in an increased yield of seed cotton. In *desi* strains an increase of 15 to 20 per cent in yield was obtained but the American strains, while showing the favourable effects of sowing large, heavy seed, were less consistent and indicated the necessity for further work on the problem.—G.M.H.

Millikan, C. R. **Antagonism between molybdenum and certain heavy metals in plant nutrition.** *Nature, Lond.* **161.** 528. 1948. [Pl. Res. Lab., Burnley, Victoria, Australia] **1119**

Water culture experiments on flax have been made at the above Laboratory and, in addition to confirming results already known, the tests have shown that it is possible to reduce the severity of iron-deficiency symptoms caused by an excess of Mn, Z, Cu, Co or Ni by increasing the supply of Mo to the nutrient solution. The significance of data obtained in regard to flax disease (lower leaf scorch) on acid soils in Victoria is recorded. Full details are to be published elsewhere.—M.H.

Boatner, C. H., Hall, C. M., O'Connor, R. T., and Castillon, L. E. **Pigment glands of cottonseed. III. Distribution and some properties of cottonseed pigments.** *Bot. Gaz.* **109.** 108-20. 1947. [Southern Reg. Res. Lab., New Orleans, Louisiana] **1120**

The distribution of cottonseed pigments between the glands and the extra glandular tissue and the oil has been investigated. In *G. hirsutum*, gossypol and gossypurpurin are contained in the glands, the former comprises from 39 to 49 per cent by weight of the gland, the latter 0.61 to 1.73 per cent. The extraglandular oil-soluble pigments were extracted with anhydrous light petroleum naphtha. A relatively stable yellow pigment has been detected in this fraction ; it is different from every pigment previously detected in cottonseed.

Since gossypol is confined to the glands and since there is a direct correlation between weight of gossypol and weight of gland, average weights of glands in cottonseed can be calculated from weight of gossypol. Control of colour is one of the difficulties encountered in the solvent extraction of cotton seed for production of oil and meal. See also *Fld Crop Abstr.* 1, *Abs.* 595.]—D.B.

Govande, G. K. **Preservation of genic wealth of cotton.** *Indian Cott. Gr. Rev.* **2.** 35-9. 1948. [Dept. Agric., Baroda] **1121**

A discussion on the importance of formulating a scheme whereby the natural populations of the various species of *Gossypium* are preserved.—G.M.H.

SUGAR BEET

Moore, H. I. **Utilization of sugar beet tops.** *Brit. Sug. Beet Rev.* **16.** 107-8 and 112. 1948. **1122**

Ploughing in the tops is the simplest method of disposal. It is wasteful but ~~not~~ necessarily bad husbandry. Research has shown that yields of barley, seeds hay and wheat which follow the ley are increased after an average crop of tops has been ploughed in. When the tops are folded off the manurial effect is comparable to that when they are ploughed in and in addition the weekly liveweight gain in the case of sheep is 2 lb. per head. If they are wilted and clean there is no difficulty in feeding the tops ; wilting is necessary for the reduction of the oxalic acid content which, being laxative, may give rise to severe scouring. Conservation of the tops by artificial drying and ensilage is also discussed.—G.M.H.

Culpin, S. **Sugar beet spacing trials in Norfolk.** *Brit. Sug. Beet Rev.* **16.** 103-6. 1948. [Assistant Director Norfolk Agric., Sta.] **1123**

It is reported that the plant populations being produced at the present time are generally about two-thirds of those required for maximum yields. Taking into account all the factors involved it is suggested that a very large proportion of the beet growing land in this country falls into a group for which the most economic row width is 18-20 in. If beet singling and harvesting can be done more economically, whether by mechanical or any other means, narrow rows are favoured more than ever. Recent developments in mechanization suggest that there might be a case for some standardisation of row widths.—G.M.H.

Hyland, M. **Drilling for sugar beet.** *Beet Grower* **1.** 211-3. 1948. **1124**

This is a practical discussion of the advantages and disadvantages of wide (over 22 in.) and narrow (under 20 in.) drills made by the plough prior to beet sowing. No argument in favour of a wider drill than 22 in. can be sustained on reasonable grounds.—G.M.H.

Garner, H. V. **The irrigation of sugar beet.** *Brit. Sug. Beet Rev.* **16.** 109-11. 1948. [Rothamsted Exp. Sta.] **1125**

Results of a preliminary trial held in 1947 to ascertain in general how sugar beet responds to artificial watering and to obtain experience in the technique of irrigation experiments. About 10 in. of water was applied by a system of overhead spraying during a period in which the natural rain fall only amounted to some 3 in. There was a first rate crop without irrigation, 20 tons of clean roots, with 19.2 per cent sugar, giving 77.3 cwt. of sugar per acre. There were over 9 tons of tops and a plant population of 35,600. The application of 10 in. of water gave a further 9.66 tons of roots, or 22.2 cwt. of sugar in spite of a depression of 2.5 per cent in sugar content of the roots. The noxious nitrogen and root purity were very little affected. —G.M.H.

Washington State College, Extension Service. Ext. Bull. No. 365. **Sugar beet production in irrigated central Washington.** By *C. E. Nelson* and *E. Kreizinger.* 1947. pp. 15. **1126**

Since 1936, nearly 13,000 acres of sugar beets have been grown annually under irrigation in Yokima, Walla Walla, Benton and Kittitas counties. This bulletin gives an account of the production and advice to the grower. The contents cover suitable soils, crop sequence, use of commercial fertilizers and application methods, preparation of the seed bed, planting, blocking, thinning and hoeing, cultivation and ditching, irrigating, harvesting and use of sugar beet by-products.—P.M.

Billette, M. Culture de la bette sucrière dans le Québec. II. Traitements visant à simplifier la culture. [**Cultivation of sugar beet in Quebec. II. Means of simplifying the cultivation.**] *Rev. d'Oka* **22.** 11-4. 1948. **1127**

Unsheared sugar beet seed is in effect a collection of seed balls, each of which usually contains from one to five viable embryos. The sowing with unsheared seeds gives clusters of plants. The advantage of using sheared seeds consists in saving labour on thinning as the percentage of single plants produced is considerably increased. The advantages of sowing in seedbeds and transplanting are also examined: this system allows an earlier sowing, the work of thinning is eliminated, and the quantity of seed required is lower.—E.B.

Morris, H. E., and Afanasiev, M. M. **Growing sugar beets following alfalfa in Montana.** *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting 1946. 389-93. [Montana Agric. Exp. Sta., Bozeman, Mont.] **1128**

Four-year tests have shown that sugar beets often fail when they follow alfalfa, due in large measure to root rot diseases of the seedling beets. It is suggested that the alfalfa be ploughed in after the second cutting, adding nitrogen in the form of manure and phosphate to ensure decomposition of the alfalfa residue before the frost; decomposition is aided by irrigation. Unless such methods are carried out, prevalence of root rots make it difficult to obtain a satisfactory stand and yield of sugar beet.—P.M.

Farm Implement Machinery Review. **The newest developments in sugar beet harvesting machinery.** *Fm Impl. Mac. Rev.* **73.** 674-7 and 778-9. 1947. **1129**

An account of demonstrations of the most modern mechanical equipment for the complete collection of the sugar beet crop, which took place in different parts of Britain during October 1947. The " Robot-Hilleshog " sugar beet harvester is in reality a system incorporating two distinct machines. One is a simple form of topper, with a rigid horizontal cutting blade that can be used in series or singly, according to the nature of the crop, and the other is a puller or lifter of the 2-row size to follow the topper. The " Catchpole," a well-known combined topper and lifter, proved especially impressive on the lighter and stone free soils. An upper elevator has now been added to this machine to work in association with the elevator that takes the beet from behind the digging points to the knockers, where the soil is removed. Lifting and cleaning in a continuous process are the combined purposes of the " Birtley-Silk " sugar beet harvester which is the 1947 sequel of the " Silk" machine. The tractor mounted " Murray," a combined sugar beet harvester, is still an exprimental machine. The " John Deere" harvester was operated with the " Catchpole" topping arrangement as a composite machine. The " Goodall" beet harvester is an adaptation of a potato elevator digger into a dual-purpose type. Three French machines, two " Loiseau" and one " Moreau" were demonstrated. The " Loiseau" machine is of the multiple-row type, preferably of the triple size and it can deliver in this case six rows of topped and cleaned beet into a single windrow. The " Moreau" machine is also a combined topper and lifter but is recommended for use binder fashion to go round and round a crop instead of row-wise, and it is tractor power take-off driven for its 2-row-working.

The "Salmon" harvester, built for delivering cleaned beet direct in a trailer, proved most effective on strong clay land. The patented steering is a notable feature of this harvester. A 2-row lifter built by Messrs. Tamkin and auxiliary equipment that is complementary to mechanized topping and lifting are also described.—G.M.H.

FARM IMPLEMENT MACHINERY REVIEW. **A complete sugar beet harvester.** *Fm Impl. Mac. Rev.* **73.** 978-9. 1948. **1130**

A detailed description of the new "International HM-I" sugar beet harvester designed for exclusive use with either a "Farmall H", "M" or "MD" tractor and for beet in 20 to 22 in. row spacings. This "composite collection of a series of integrated and synchronising units" is primarily designed for the small grower (20 to 60 acres of sugar beet), but the larger grower would find it equally serviceable in series. Capacity is given as 6 tons harvested per hour at a rate of 20 ton to the acre.—G.M.H.

VERBURGT, J. W. Proefkuilenonderzoek 1943-1944. [**Clamping experiment, 1943-1944.**] *Med. Inst. rat. Suikerprod.* 1946. 183-92. [English and French summaries, pp. 191-2.] [Inst. rat. Suikerproductie, Bergen op Zoom, Netherlands] **1131**

At the end of 1943, war conditions made it impossible to transfer to the factories the sugar beet grown on the islands off the north coast of the Netherlands, and the crop was clamped from approximately November 1943 to January and in some cases February 1944. The present report on the effect upon sugar content, root weight and therewith quantity of sugar produced (both reduced), and on factors causing respectively earlier or later rotting, shows that although in this instance clamping resulted in the production of sugar which would otherwise have been lost, the process is not economically justifiable and should be regarded as an emergency measure only.—G.M.R.

MANCHESTER UNIVERSITY, Agricultural Economics Department. Bull. No. 41/EC17. **Sugar beet costs and returns 1947 crop.** 1948. pp. 10. **1132**

This annual inquiry into the economics of sugar beet production covers the Shropshire and Staffordshire area. Cost data for the 1947 crop for 61 farms are given. Costs and returns per ton of clean beet for 1947-48 were: cultivations £1 2s. 2d., harvesting and transport £1 3s. 11d., seed and manures (net) 16s. 2d. Net cost per ton was £3 7s. 1d. and the value per ton £4 10s. 3d.—G.M.H.

CAMBRIDGE UNIVERSITY, Department of Agriculture, Farm Economics Branch. Report No. 34. **A survey of the cost of producing sugar beet in three districts in the Eastern Counties 1946.** By *L. Uribe* and *E. E. Hessel.* [mimeographed] 1948. pp. 10. **1133**

The costs of producing sugar beet on 61 farms in the Eastern Counties during 1946 have been studied and the following results obtained: (a) On heavy soil at Bury St. Edmunds the cost was £36 18s. 3d.; on light soil at Ispwich the cost was £30 18s. 0d. per acre; on fen soil in the Isle of Ely the cost was £35 2s. 1d. (b) Average yields and receipts per acre were:

	Tons	cwt.	qrs.		£	s.	d.
Bury St. Edmunds ..	12	16	1	clean beet	59	9	6
Ispwich ..	10	15	0		49	4	1
Isle of Ely ..	12	14	0		54	7	0

(c) The districts of the heavy soil required most labour and showed the highest cost per acre but gave highest yield and highest receipts and net profits per ton and per acre.—G.M.H.

UTAH, Agricultural Experiment Station. Bull. 329. **Cost and efficiency of producing sugar beets in Utah, 1945.** By *E. M. Morrison.* 1948. pp. 30. **1134**

A total of 161 farms was surveyed; 56 in Cache County, 48 in Box Elder County, and 57 in Utah County. The survey covered the 1945 crop year. Approximately 9 per cent of the capital investment in the farms surveyed was chargeable to the sugar beet enterprise which correspondingly occupied about 9 per cent of the land. The average farm had 113.3 acres of land of which 83.3 acres were irrigated and of this amount 10.7 acres were occupied by beet enterprise. The average amount of capital invested in the sugar beet enterprise was $2880 per farm.

Cost per acre of growing and harvesting sugar beets varied from $80 to $180 with an average cost of $132.34. Cost per ton varied from $5.43 to $19.86 with an average of $8.69.

Total receipts per acre were $185.80 or $12.20 per ton. These included payment by the processors of $9.43, $0.35, the value of tops, and government benefit payments of $2.42.

Net returns averaged $3.51 per ton, or $53.46 per acre.—From Author's summary.

GASSLANDER, C. H. Frödling på övervintrande sockerbetssticklingar. [**Seed production with overwintering sugar beet stecklings.**] *Svensk Frötidn.* **16.** 5-9. 1947. **1135**

In Denmark sugar beet seed production is carried out almost exclusively according to the overwintering method. Sowing on the fallow is considered more reliable than in a cereal nurse crop. The mean yield in Denmark 1932-41 was 1923 kg. per ha. with a lowest yield of 957 kg.

and a highest yield of 2442 kg. per ha. Corresponding figures in Sweden with the re-planting method were 2642 kg. per ha. mean yield, with lowest yield 1977, and highest 2922 kg. per ha. The Danish mean yield during that period was 72.8 per cent of the Swedish.

The writer is of the opinion that by the re-planting method, better seed and a more reliable yield are obtained, and that the overwintering method is to be regarded as an emergency measure.—R.P.J.

STEHLÍK, V. Jednoklíčkove řepové semeno. [**The single germ beet seed.**] *Sborn. čes. akad. zeměd.* **19.** 2-8. [English and Russian summaries, pp. 7-8] 1946. **1136**

Technical means and processes are described in which the seed cluster is crushed and broken in such a way that each part contains only one seed in its cover. Knoll in Germany and Bainer in California began the construction of such a grinding machine in 1940. A picture shows the normal and ground seed clusters. The author gives preference to the American method of "decorticated" seed which is most uniform and yields only a small amount of barren grindings (approx. 20 per cent).

Segments of decorticated beet seed contained only 8 per cent double germ seed segments, the remainder were all segments containing single seeds. The percentage of germination seems to depend on the method of grinding, but averages 70 per cent of single-germ seeds and 20 per cent double germ seeds.

The importance of the use of a special seeding machine is stressed to assure regular spacing in the rows. Single germ seed is not recommended for weedy, boggy or badly prepared fields. The advantages of the use of single-germ beet seed lie in saving of man hours (manual thinning) and in the possibility of using mechanical means for thinning. Yields are slightly lower than those of normal seeding.

A new method is propagating single beet seeds contained in pellets, but the use of these has not yet been tried out in Czechoslovakia and seems to be very expensive.—K.A.A.

GASKILL, J. O., and KREUTZER, W. A. **Seed treatment dosage rate studies on the control of damping-off of sugar beets.** *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting 1946. 341-8. [Associate Pathologist, U. S. Dept. Agric., and Plant Pathologist, Colorado Agric. Exp. Sta.] **1137**

Pythium ultimum, *Phytophtora* and *Fusarium* were considered to be causes of damping-off in the six experiments conducted. The following chemicals are recommended (ounces per 100 lb. of seed): Arasan, 16; new improved Ceresan, 6; 2 per cent Ceresan, 127; Du Pont 1452-F, 5; yellow cuprocide, 16.—P.M.

DOWNIE, A. R. **Seed treatment studies.** *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting 1946. 361-3. [Plant Pathologist, Beet Seed Operations, Amer. Crystal Sug. Co., Rocky Ford, Colo.] **1138**

In 1944 and 1945 seed treatment tests were conducted in several areas where sugar beets are grown for the American Crystal Sugar Company. Significantly better stands were obtained with New Improved Ceresan and Arasan. In greenhouse tests Phygon gave similar results. The degree of protection given by these treatments varied for different soils and it is thought that this may be due to different kinds of organisms infecting different soils.—P.M.

ISAKSSON, A., BREWBAKER, H. E., and BUSH, H. L. **Seed treatment tests 1944 and 1946.** *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting 1946. 349-59. [Plant Pathologist (A.I.), Director (H.E.B.) and Statistician-Agronomist (H.L.B.) Exp. Sta., Great Western Sug. Co., Longmont, Colo.] **1139**

In two series of tests with seed treatments against seedling diseases in sugar beets, various treatments showed great variation in the effect of a given treatment in different fields. In spite of these variations observations showed that New Improved Ceresan and Arasan consistently ranked high among the best; Du Pont 1452-F and Cuprocide were less consistent when used in combination or alone but still ranked high.—P.M.

WALLIS, M. **Blackleg of beet in Co. Wexford.** *Beet Grower* **1.** 227-8. 1948. **1140**

This article records some practical observations in the field and the writer's deductions. The most important factors helping the disease are those that hinder the proper growth of the seedling and include (a) acidity, with a consequent lack of exchangeable calcium; (b) lack of any of the major nutrients necessary for proper plant growth (nitrogen would seem to be the most important as it acts as a stimulant to the young plant at the time of attack); (c) other factors hindering proper plant development e.g. poor cultivation prior to sowing, the formation of a crust on the top of the drill, a clay pan underneath, or any other conditions bringing about poor drainage or lack of aeration in the soil. It is suggested that the only means of overcoming blackleg disease at the present time is by practising good husbandry.—G.M.H.

CUSSEN, G. **The blackleg disease of sugar beet.** *Beet Grower.* **1.** 214-8. 1948. **1141**

This condensed report indicates the lines upon which the Plant Pathology Department of University College, Dublin is directing its investigations into sugar beet diseases. Observations indicate that seed treatment by dusting is not a reliable answer to the blackleg problem. Pending further investigations it is suggested that the farmer pays particular attention to seed bed tilth and general fertility which includes the correction of sourness. —G.M.H.

COONS, G. H., KOTILA, J. E., and BOCKSTAHLER, H. W. **Black root of sugar beets and possibilities for its control.** *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting 1946. 364-80. [Principal Pathologist (G.H.C.), Senior Pathologist (J.E.K.) and Assist. Pathologist (H.W.B.) Divn. Sug. Pl. Invest., Bur. Pl. Ind., Soils and Agric. Engng., Agric. Res. Admin., U. S. Dept. Agric.] **1142**

In the humid districts of eastern U.S.A. sugar beet seedlings are frequently affected by diseases commonly referred to as black root. Clover and alfalfa before beet, appear to promote the increase of the micro-organisms that attack seedling beets. It is suggested that the best conditions for planting beets is after corn and soybeans. If this is not possible, and the beets have to be planted after clover or alfalfa, then these crops should be ploughed in either in August or September. A liberal application of phosphate has been found to be beneficial as well as treatment of the beet seed with a recommended fungicide such as Ceresan. *Aphanomyces cochlioides* is the main organism that attacks the beet roots after thinning. It is thought that new varieties which are resistant to leaf spot and which have shown some resistance to *A. cochlioides* may lead to ultimate control of both diseases.—P.M.

HENDERSON, R. W., and BOCKSTAHLER, H. W. **Reaction of sugar beet strains to** *Aphanomyces cochlioides*. *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting 1946. 237-45. [Associate Geneticist and Asst. Pathologist, Divn Sugar Pl. Invest., Bur. Pl. Ind., Soils and Agric. Engng] **1143**

Breeding work aimed at producing varieties resistant to *A. cochlioides* is reported. The variety U.S. 216, a leaf spot resistant strain has shown resistance to *Aphanomyces*. Progenies which have been developed have been markedly resistant to the organism.—P.M.

LEACH, L. D. **Seed-borne phoma and its relation to the origin of sugar beet seed lots.** *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting 1946. 381-8. [Associate Plant Pathologist, Calif. Agric. Exp. Sta., Davis, Calif.] **1144**

The seedling disease of sugar beet caused by *Phoma betae* is unique in that the casual organism is seed-borne whereas other types of such diseases are caused by soil fungi. The disease has been located especially among seed produced in regions with frequent showers or high humidity during the period of seed maturity and harvest. A good liquid disinfectant is ethyl mercury phosphate solution. Ceresan and New Improved Arasan proved efficient as dust fungicides, and good control was obtained with Phygon and Arasan.—P.M.

AFANASIEV, M. M., and MORRIS, H. E. **Effect of different soil and seed treatments on the control of seedling diseases of sugar beets under controlled conditions.** *Proc. Amer. Soc. Sug. Beet Technol.* 4th Gen. Meeting 1946. 331-40. [Montana Agric. Exp. Sta., Bozeman, Mont.] **1145**

Six seed disinfectants in common use failed to protect beet seedlings from diseases. In experiments, the seed was coated with treble superphosphate and sodium nitrate ; this also failed to give protection. It was found that untreated seed planted in a soil well supplied with complete fertilizers suffered only to a slight degree from the disease.—P.M.

BILLETTE, M. Maladies de la betterave à sucre. [**Diseases of sugar beet.**] *Rev. d'Oka* **21.** 255-9. 1947. **1146**

A survey is given of the more usual diseases of sugar beet and of the remedies to control them. It appears that diseases affecting the seeds are more easily controlled. Mercury products and copper oxide are the most effective remedies.—E.B.

DUYM, C. P. A., KOMEN, J. G., ULTÉE, A. J., and WEIDE, B. M. van der. **The inhibition of germination caused by extracts of seedballs of the sugar beet** (*Beta vulgaris*). *Proc. ned. Akad. Wet.* **50.** 527-35. 1947. [Bot. Lab., Utrecht] **1147**

The inhibiting effect of an extract of beet seed upon germination in other seeds is due to an excessive content of inorganic components in the extract. The effect cannot be attributed to a given inorganic compound, but is based on the osmotic concentration of the extract. Mannitol, and a mixture of pure inorganic salts also, with a corresponding osmotic concentration produce the same effect and, like the extract, produce a greater effect in the light than in the dark. *Landbouwk. Tijdschr.* 60-67. 1948.—G.M.H.

SORIANO, A. Los géneros de Quenopodiáceas de la flora argentina. [**The genera of Chenopodiaceae in the Argentine flora.**] *Rev. argent. Agron.* **15.** 1-18. 1948. **1148**

The author presents a diagnosis of the family, a discussion of the organography, phylogenetic relations and uses of the Chenopodiaceae, keys for the determination of the genera, and short, illustrated descriptions. In some of the salt soils of Argentina *Beta vulgaris*, var. *perennis* grows wild. *B. vulgaris* var. *rapacea* and var. *cicla* are cultivated.—G.M.R.

ROOT CROPS

GREVE, M. Roernes Udtynding. [**Singling of roots.**] *Ugeskr. Landm.* **93.** 312-3. 1948. **1149**

With rows 55 cm. apart small topped fodder beet plants should be 20 cm. apart, which corresponds to 5 plants per m. or approximately 90,000 per ha. ; the larger topped forms and fodder sugar beet should have a distance of 25 cm. between the plants, corresponding to 4 plants per m. or 72,000 per ha. For sugar beet which is sown in drills 47 cm. apart the distance between the plants should be 30 cm., corresponding to 3 × 3 plants per m. or 70,000 per ha. Swedes with a distance between the rows of 55 cm. should have about 40 cm. between the plants, corresponding to 2 × 5 plants per m. or 45,000 per ha.

In trials to compare mono-germ beet seed with ordinary seed it was found that 18 kg. ordinary beet seed per ha. gave 38 plants per metre row with 13 per cent single plants, 12 kg. ordinary beet seed gave 28 plants per m., of which 22 per cent were single, and 12 kg. mono-germ beet seed gave 23 plants per m., of which 34 per cent were single. The thinner plant stand and the increasing number of single plants resulted in reducing the time spent in singling by 10 and 22 per cent respectively. As mono-germ seed germinates later than normal seed and is more exacting in regard to the cultivation condition of the soil, it is advisable for the present to sow ordinary seed at the lower rate of seeding.—R.P.J.

PAIS DE CAMARGO, A. Corte de tubérculos de cará (*Dioscorea alata* L.) [**Cutting yam tubers.**] *Bragantia* **7.** 55-65. [English summary, p. 65.] 1947. [Inst. Agron., Campinas, São Paulo, Brazil] **1150**

Experiments with true yam (*Dioscorea alata* L.) were conducted in the Campinas and Tiete districts, State of São Paulo, in order to study the relative value of the apical, basal and lateral sets of tuber of fair size, as compared with whole seed tubers of equal size, with the purpose of investigating the possible saving of marketable tubers. Stand percentage and yield were good, being practically the same both for whole seed tubers and their apical and basal sets. Lateral sets gave poor stand and yield. Plants originated from basal sets yielded a lower average for tuber weight. On the other hand these same plants produced a larger number of tubers. This accounts for the lower tuber weight. The use of both apical and basal sets of tubers of fair size may be recommended if small tubers are scarce. This results in a greater saving in seed.—Author's summary.

AGRICULTURAL ENGINEERING RECORD. **Universal root harvester.** *Agric. Engng Rec.* **2.** 66-9. 1948. **1151**

The N.I.A.E. have developed a simple, small machine, based on a modification of an imported sugar beet harvester, for harvesting potatoes, sugar beet, turnips, swedes, mangolds and carrots. The prototype is illustrated and described and notes are given on the methods of working and the performance of the machine over the last two years. A simple design has involved the acceptance of a lower standard of work, or more handwork than is usual with existing potato and sugar beet harvesters, but the aim has been to produce a cheap machine for the farmer who cannot afford more than one implement for potato and root lifting. Further development is still necessary and will include modification to the rear elevator and the design of special shares for sugar beet lifting.—G.M.H.

BATEMAN, A. J. **Contamination of seed crops. 1. Insect-pollination.** *J. Genet.* **48.** 257-75. 1947. [John Innes Hort. Inst. Merton] **1152**

There are two types of contamination of seed crops, mechanical admixture of seed and cross-pollination. The latter is the more difficult to eradicate. There are four main variables affecting cross-pollination between varieties : (1) the breeding system of the species ; (2) isolation distance ; (3) varietal mass ; (4) pollinating agent. Of these (3) and (4) have been most neglected. There is little work available entailing a systematic study of these four factors.

Using two insect-pollinated self-compatible species, radish and turnip, and suitable amounts of plants of the contaminating and contaminated varieties, the effect of distance on isolation is similar over a range of from 0 to 160 ft. At first there is a rapid reduction in contamination with increasing distance, but there is a progressive reduction in the decreases in contamination produced by repeated increases in isolation distance. In the experiment most conducive to contamination this fell from 60 per cent at 20 ft. to 13 per cent at 80 ft., but at 140 ft. it was still 6 per cent. In this same experiment, involving greater isolation distances than the others, on increasing the isolation distance from 160 to 580 ft. there was no evidence of a further decrease in contamination, which remained in the neighbourhood of 1 per cent. As there are *a priori* reasons for expecting some decrease it must be presumed to be too slight for detection.

The mass of a variety (here altered by varying the number of rows from 1 to 12), and the spatial arrangement of the plants, are as important in their effects on contamination as isolation distance. Mass is also similar to isolation distance in its mode of action, in that constant increases in the number of plants of a variety growing together produce progressively smaller decreases in its contamination.

When pollinating insects are free to distribute themselves over a crop they do so in such a way that density of planting has no effect on the rate of decrease of contamination with increasing isolation distance.—From Author's summary.

Hofsten, C. G. von. Ogräsbekämpning i morotsodlingar. [**Weed control in carrot plots.**] *Lantm. Svenskt Land.* **32.** 369. 1948. **1153**

Spraying carrot plots with a 4 per cent solution of sulphuric acid at the rate of approximately 1500 litres per ha. (63 kg. crude acid/ha.) gives good results, when carried out 2 or 3 days before the carrot seedlings appear. *Sinapis* and other very susceptible weeds are easily killed. *Stellaria media* is effectively controlled if the spray is applied before the second pair of leaves has been developed.—R.P.J.

Cambridge, National Institute of Agricultural Botany, Seed Production Committee. Seed Not. No. 21. **Some pests of Brassica seed crops.** 1948. pp. 4. **1154**

The Pollen Beetle (*Melegethes aeneus*), Swede Seed Weevil (*Ceuthorrhynchus assimilis*) and Bladder Midge (*Dasyneura brassicae*) are all pests which can cause serious loss of seed, especially during dry seasons. Pollen Beetle attacks many species of brassica, notably swedes, and in some seasons may reduce the yield of a crop by 50 per cent. Dusting well with 5 per cent DDT dust is the most favoured method of control. It should be withheld until the population of beetles has risen to about 50 per plant.

Swollen pods known as " bladder pods" are due to the grubs of the bladder midge and can often be found in brassica seed crops. " Bladder" pods open prematurely and any seed in them is shed while the crop is being cut. Damage is caused by the grubs of the Bladder Midge feeding within the pods. The midge is, however, unable to effect an entry to lay its eggs in the seed pods unless these have been previously punctured by the Swede Seed Weevil. The latter does little harm to the plants except to lay them open to an attack of midge.—G.M.H.

MacLachlan, J. D., and Strong, W. F. **Spraying and dusting turnips to prevent water core, a disorder caused by boron deficiency.** *Sci. Agric.* **28.** 61-5. 1948. [Ont. Agric. Coll. Guelph., Ont.] **1155**

Foliage application of borax to prevent water core (brown heart) development in turnips (rutabagas) has given very satisfactory results on a large acreage basis in western Ontario. The borax may be applied as a spray or as a dust. The spray ingredients are 12 lb. of borax of sufficient fineness to pass through spray nozzles as a suspension, 3 lb. of bentonite clay and 1 pint (20 fluid oz.) of Orthex in 40 imperial gal. of water. The borax and clay should be mixed together while dry prior to adding to the water. The dust ingredients are finely powdered borax (300 mesh) and No. 209 Celite mixed in equal proportions by weight. An application of 40 to 50 gal. of the spray, or 40 to 50 lb. of the dust, per acre should be made when the diameter of the turnip root is between 1 and 1.5 in. Custom spraying or dusting with powered equipment is recommended. In areas where spray or dust equipment is not available and where soil fixation of boron is rapid, it is suggested that granulated borax be applied as a side-dressing or broadcast with a hand cyclone grass-seeder at the rate of 20 to 30 lb. per acre after the seedling plants are thinned.—Authors' summary.

Correia, F. A. Ácido cianídrico em algumas variedades de mandioca. [**Hydrocyanic acid in some varieties of** *Manihot utilissima*.] *Bragantia* **7.** 15-22. 1947. [Inst. Agron. Campinas, São Paulo, Brazil] **1156**

Different varieties of cassava were analysed for the HCN content of the root, the peel and central part being studied separately. In the varieties most commonly grown in the State of São Paulo, the greater proportion of the HCN content of the root, namely, 60 per cent, is located in the peel. When the grated root is exposed to the sun for three days to be dried, an average of 73 per cent of the total HCN content is lost. Practically all of the toxic element is lost when the edible, central part of the root is boiled to the requisite degree of softness.—G.M.R.

CROP BOTANY

ТАБЕНЦКИЙ, А. А. Структура хлорофилловою зерна как показатель жизнедеятельности листа. *Извест. Акад. Наук, СССР.* Сер. Биол. 1947. *No.* 5. стр. 609-32.

Tabenckiĭ, A. A. [**Structure of chlorophyll grains as an indication of leaf vitality.**] *Izv. Akad. Nauk SSSR.*, Ser. Biol. 1947. No. 5. pp. 609-32. [All-Union Sci. Res. Inst. Sugar Beet, Kiev] **1157**

The paper was given to the All-Union Conference on Photosynthesis, 22-6 October, 1946 and is concerned primarily with changes in the number and size of chloroplasts in sugar beet leaves at different growth phases, and also with chlorophyll grains in twenty other species of plants which include those of *Beta*, *Phaseolus*, *Helianthus* and *Zea mays*.—M.H.

CROP PHYSIOLOGY

GRINSTEIN, M. El uso de isótopos en las investigaciones biológicas. [**The use of isotopes in biological research.**] *Ciencia Invest.* **4.** 96-106. 1948. [Washington Univ. Med. Sch., St. Louis, Mo., U.S.A.] **1158**

A review of the literature (51 references) includes a note on the use of isotopes in plant physiological research and indicates where further information on this subject can be obtained.—G.M.R.

BLACKMAN, V. H. **The place of plant physiology in crop research.** *Emp. Cott. Gr. Rev.* **25.** 91-101. 1948. **1159**

Some examples are given of the contributions to agriculture and crop research which have been made by plant physiological investigations, and in particular by those of the crop analysis type (i.e. the study of the physiological behaviour of the crop in the field). The examples include the physiology of cotton in the Sudan Gezira and in Egypt, comparative studies of field crops, and weed control in linseed and flax.—G.M.H.

MACVICAR, R., and TOTTINGHAM, W. E. **A further investigation of the replacement of boron by indoleacetic acid.** *Plant Physiol.* **22.** 598-602. 1947. [Univ. Wisconsin, Madison] **1160**

" It has been reported that low concentrations of indoleacetic acid in the nutrient solutions supplied to cotton seedlings will partially replace boron for growth in cultures deficient in this element. This finding constitutes a fundamental advance in the elucidation of the rôle of boron in the metabolism of the plant. The further implication of auxins in respiration and growth indicates that boron might function through some relationship with these enzymes." The work has been extended to sunflower, tomato, tobacco and soybean and repeated on cotton, but using sand culture technique. No significant alleviation of boron deficiency by indoleacetic acid was noted.—D.B.

NIJHAWAN, S. D., and DHINGRA, L. R. **Distribution of soil moisture under crop and its relation to yield.** *Indian J. agric. Sci.* **16.** 169-77. 1946. [Dry Farming Res. Sta., Rohtak] **1161**

The moisture requirements of *Pennisetum typhoideum*, *Cyamopsis psoralioides*, *Cicer arietinum* and *Triticum vulgare* were studied during several seasons. Soil moisture determinations were made to a depth of 6 ft. at intervals from before the time of sowing until harvesting. In the case of the kharif crops *P. typhoideum* and *G. psoralioides*, it is the former crop which suffers more during drought on account of its larger vegetative growth. Both these crops require larger amounts of water for growth than in the case with the rabi crops of *C. arietinum* and *T. vulgare.* The grain yield of *P. typhoideum* is largely affected by the amount of August rains which come at the time of seed formation. Should these fail, the crop begins to dry up and the resulting yield is poor. On the other hand, *G. psoralioides* normally depends on moisture from the upper soil layers and during drought it can draw on water from lower layers to facilitate seed formation.

Yields of both the rabi crops, moisture present at the time of sowing and winter rainfall were measured and correlated. Significant correlations between moisture present at sowing and yields of grain and straw were found in the case of *C. arietinum* but not for *T. vulgare.* Results further suggested that the yields of *G. psoralioides* and *C. arietinum* can be predicted fairly accurately from moisture present at the time of sowing.—M.E.E.

FRANCO, C. M., and LOOMIS, W. E. **The absorption of phosphorus and iron from nutrient solutions.** *Plant Physiol.* **22.** 627-34. 1947. [Instituto Agronomico, Campinas Brazil, and Iowa St. Coll., Ames] **1162**

As a contribution to the study of ion balance in nutrient solutions seedlings of *Zea mays*, *Brassica oleracea* var. *italica*, *Glycine max*, *Lycopersicon esculentum*, *Helianthus annuus*, *Gossypium hirsutum* and *Oryza sativa* were grown in culture solution and compared for growth, colour, and phosphorus absorption. " It is probable that iron chlorosis has more effect on solution culture results than any other single factor, and frequently than all other factors. Iron absorption from cultures is reduced by phosphorus, probably by H_2PO_4—ions especially, at pH's of about 6.0 or higher. The use of $Ca_3 (PO_4)_2$ reduces the trouble as does the use of enough KH_2PO_4 to maintain a pH below 5.5. In tank culture H_2SO_4 may be used more cheaply to accomplish the same result. In miscellaneous work with the Knop type of solution chlorosis can be reduced or prevented by omitting phosphorus from the solution and adding it separately 2-4 days later after iron has been absorbed."—D.B.

CIFERRI, R., and CIFERRI, F. Seleniati e seleniti al saggio di Macht sul lupino ed azione della cisteina associata ai sali di selenio. [**Action of seleniates and selenites in Macht's test on lupin and of cystein associated with selenium salts.**] *Atti Ist. bot. Univ. Pavia* Ser. 5. **3.** 329-32. [English summary, p. 332.] 1943-47. **1163**

Sodium seleniate and selenite have an activating action on the elongation of the hypocotyl until about 11-12 parts per million ; at higher concentrations they become slightly inhibiting. Cystein chloridrate highly activates the development of the hypocotyl, but this action is reduced if cystein is associated with selenium salts.—E.B.

Thimann, K. V., and Bonner, W. D., Jr. **The action of tri-iodobenzoic acid on growth.** *Plant Physiol.* **23.** 158-61. 1948. **1164**

Mixtures of TIBA and auxin produce much greater curvature in internodes of *Pisum* than does auxin alone, and also a greater degree of curvature in *Avena* coleoptiles. TIBA acts in such a way as to promote, not to oppose the effects of auxins. In no case did TIBA alone produce curvature. An explanation, based on competition, is offered.—D.B.

Gregory, F. G. and Purvis, O. N. **Reversal of vernalization by high temperature.** *Nature, Lond.* **161.** 859-60. 1948. [Imp. Coll. Sci. Tech., London] **1165**

The conclusion that as the period of low temperature treatment is extended, the vernalized condition induced becomes less and less easily reversible and finally is completely stable (*Herb. Abstr.* 15, Abs. 1579) has been confirmed by further experiments with winter rye. There is indication also that the stability of the vernalized condition increases with the degree of development taking place during the low-temperature treatment, because far more reversal occurs when the grains are prevented from growing by restricted moisture supply during vernalization. The practical importance of this gradual establishment of an irreversible condition of vernalization in relation to effects of sowing date on time of flowering of vernalized grain is discussed in a paper now in the Press.—M.H.

CROP BIOCHEMISTRY

Melchers, W. J., and Gerritsen, H. J. Koper als onmisbaar element voor plant en dier. **Copper as an indispensable element for plants and animals.** [German, French and English summaries, pp. 39-53.] 24 × 16. pp. 56. 25pls. incl. chromopls. Wageningen : N. V. Drukkerij "Vada," Gebr. Zomer en Keuning. 1944. **1166**

The last 20 years have seen a considerable advance in the study of the causes, symptoms and control of the plant disease commonly called "reclamation disease" and due to a faulty copper balance in the soil. The disease has been a source of loss in the Netherlands and a considerable amount of research has been done there, and now a useful summary of the available knowledge comes also from that country. The work provides information on the types of soil affected and the manner in which the faulty balance is produced. ("Copper deficiency" is not always a correct description of the trouble, for in many cases copper is actually present, but in a form which it is difficult for the plant to absorb.) Information is also given on the susceptibility of different plants to reclamation disease and the symptoms produced in eac on the disease in grassland, on the disease produce in animals by grazing affected grassland or by eating hay from it, and on the determination of coppe deficiency in the laboratory ; and finally there is discussion of remedial measures and the use o various fertilizers containing copper.

Of the crop plants, cereals and some legume suffer most under copper deficiency. Wheat an canary seed are more susceptible than barley o oats, and rye is the least susceptible cereal. O oats, again, white and yellow oats are more susceptible than black oats. Peas are very seriousl affected by copper deficiency, beans somewhat less while vetch, serradella (*Ornithopus sativus*) an lupins are more or less immune to the disease Red clover (*Trifolium pratense*) is very susceptib to injury. White clover (*T. repens*) exhibits a first an apparent resistance in that it flowers prolifically and gives the stand or sward a spuriou aspect of luxuriance, but there is little leaf and lea colour is pale, and eventually the plant disappears Of the roots and tubers, sugar beet is the mos susceptible crop, followed by turnips. Carrots however, are little affected, and some other cro plants such as spurry and buckwheat appear to b immune to the disease.—G. M. Roseveare.

Bernstein, L., and Thompson, J. F. **Studies o the carotene-destroying processes in drying bea leaves.** *Bot. Gaz.* **109.** 204-19. 1947. [Hu Bot. Lab., Univ. Chicago] **116**

The two carotene-destroying mechanism studied (under controlled conditions) were enzym action and light. Both processes are importan causes of loss of carotene in field cured hay. I partially dried leaves carotene is destroyed rapidl by both processes, only about 50 per cent remaining. Carotene destruction occurs first in the oute cells of the leaf and proceeds inwards. The effec of leaf moisture content, temperature, light intensity and wave length on carotene destructio are discussed. Atmospheric oxygen is essential fo enzymic destruction and also increases photodestruction.—D.B.

КАНАЕВ, И. И. О витамине Т. *Прйрода Москва*, 1948. *No.* 1. стр. 60.

Kanaev, I. I. [**Vitamin T.**] *Priroda, Moskva* 1948. No. 1. p. 60. **116**

Information on this vitamin has been recorde in a new journal, *Östrr. Zool. Zeitschrift*, Vol. 1 No. 1, 1946. The vitamin, discovered by Gëtš i insects (termites), and certain fungi, was firs named Termitin, or Penicin, or Insectin, but ha been finally termed the Vitamin T-complex. Vita processes in animals and plants are affected by th substance (increase of growth rate and of fertility) Further information on the vitamin is to be published in the same journal.—M.H

ENVIRONMENTAL STUDIES

МАТАСОВ, М. И. Сезонное развитие в Якутской природе в 1946 г. *Природа, Москва*, 1948. *No.* 1. стр. 69-73.

MATASOV, M. I. [**Seasonal development under conditions in Jakutsk during 1946.**] *Priroda, Moskva* 1948. No. 1. pp. 69-73. 1948. **1169**

Part of this paper is concerned with climatic conditions and plant growth at Jakutsk (lat. 62.5N. long. 129.40E). In the early summer of 1946 the following data were obtained:

Growth phase	Date	Average date	Deviation
Onset of tillering, (spring sowings, and oats) ..	16/6	14/6	+2
ditto (wheat and barley)	18/6	—	—
Onset of stooling (spring sowings)	20/6	23/6	—3
ditto (wheat)	22/6	1/7	—9
ditto (oats)	24/6	—	—
Flowering of wild flax ..	6/7	14/6	+22

In the year of these records an early onset of autumn shortened the vegetative period. The summer, and the vegetative period as a whole (especially the first half of spring), were favourable for crop growth and good yields.—M.H.

AUSTRALIA, COMMONWEALTH METEOROLOGICAL BUREAU. **Studies in applied climatology. W. Aust. Pamph. No. 1. Climate of the West Australian wheat belt with special reference to rainfall over marginal areas.** By *C. E. Hounam.* 1947. pp. 32. **1170**

The criteria developed as means of determining the marginal limit of the wheat belt are the 8-in. isohyet for the period April to August, the seasonal growth factor (7 per cent) and the influential rainfall factor (20 per cent). The economic limit to wheat growing appears to be only a few miles east of the Government northern railway while south of Buntine the limit is further inland towards Koorda. The position of the limit over central areas appears doubtful but an approximation would be a line from Koorda to Walgoolan. Varieties recommended by the Department of Agriculture, W.A., for planting in areas where the average annual rainfall is less than 14 in. are Kondut (mid-season), Bencubbin (mid-season) Koorda (early) and Bungulla (very early). May is the best month for planting and the whole programme should be completed within that period, although early maturing varieties may be planted as late as June.—G.M.H.

FINA, A. L. de. Propuesta de una neuva definición de clima. [**Proposed new definition of climate.**] *Rev. Meteorologia* **6.** No. 23. pp. 2. 1947. [Prof. Climatology and Phenology, Fac. Agron., Univ. La Plata, Argentina] **1171**

Definitions of climate hitherto given tend to be inexact and vague. The following is proposed: " Climate is the aggregate of the different daily and annual modalities [modes] of the weather frequent at one point of the earth's surface." It is intended thus to stress the fact that climate is not something static or of regular and ordered course, but the incessant and complex modification of the state of the weather, in the course of which, however, a daily and annual periodicity may be distinguished. Study of the proposed definition indicates that two climates must be considered distinct when (a) the *aggregate* of the different daily and annual modalities of the weather of each of the climates is *distinct*, or (b) the aggregate of the different modalities is the same in both climates, but the *frequency* with which each modality is repeated in the course of the years is different.

The views of readers are requested.—G.M.R.

TAXONOMY

IOWA Agricultural Experiment Station. Res. Bull. 351. **Investigations in seed classification by family characteristics.** By *D. Isely*. 1947. 317-80. **1172**

Seventeen important agricultural and weedy plant families are discussed from the standpoint of seed characteristics. A synopsis of family characteristics is given as an analytical key, which is based on seed structure as indicated by external and internal characters. In describing each family, a short account of the principal diagnostic characters to be used in recognizing the group is followed by a more detailed discussion. This is divided into morphology, external characteristics, associated structures and classification by seed characters. The associated characters refer to plant parts closely associated with the seeds and frequently persistent about them at maturity. Classification by seed characters deals with the use of applying variations of seed structure within the particular family to subdivisions with tribes or other principal groups.—P.M.

BOOKS AND PERIODICALS

(*For other books reviewed in this issue, see Abs.* 1059 *and* 1166).

DEERING, F. **USDA manager of American agriculture.** 22 × 14. pp. 239. Norman: University of Oklahoma Press. pls., tables, charts. 1945. $2.50. **1173**

" The fact that the United States Department of Agriculture stands out as a huge public agency, with many branches whose services are intended to help the farmer do a better and more profitable job of farming, is not to be taken as conclusive evidence that it is efficient or satisfactory." Mr. Deering devotes some 200 pages demonstrating that the U.S.D.A. is in many things inefficient and in most things unsatisfactory. His many destructive criticisms are however balanced by many sound and constructive ideas for reorganisation of the Department.

In the first two chapters he briefly reviews the growth and development of the Department from the pre-Patent Office period up to the present day, and it becomes clear that the present day multiplicity of agencies, bureaux and administrations can be attributed to basic weaknesses in its organisation. Congress solved, or attempted to solve problems as they arose and separate legislation was adopted to provide nearly every separate service, in most cases creating new bureaux or making it possible to create new bureaux to administer each programme. According to the author, the result is that the Department is in reality many departments of agriculture, put together haphazardly with instances of several bureaux doing, or attempting to do the same work. He quotes many instances of attempts at reorganization and co-ordination; in most cases new administration grew out of such attempts, and the policy seems to have been to reorganize without disturbing existing bureaux.

His theme of ' duplication of effort ' is developed in succeeding chapters, in which he deals at some length with funds and benefits and their administration, research, soil conservation, prewar policies of restrictive practices in production, subsidies, agricultural credit, special services and their administration, rural health, and education and information. In each case it is a story of duplication of effort and overlapping of authority; in each case he advances ideas for the elimination of unnecessary functions and controls and reorganization on a business-like basis. The fact that Congress is in no mean way responsible for this state of affairs has not been ignored, and greater emphasis may have been put on the fact that the U.S.D.A. is itself the victim of the whims of Congress and even individual Congress men.

To accomplish real reorganization, he is of the opinion that there must be an outspoken demand on the part of the farmers affected, the assistance of officials of the U.S.D.A., and an act or acts o Congress to smooth out difficulties arising from various pieces of legislation affecting the Department, its activities and its appropriations. He puts forward four basic suggestions: the retention o the desirable and useful functions of all bureaux and agencies; reorganization of all bureaux and agencies into one single Department of Agriculture having three main divisions—Research, Administration, and Education and Information; channelling of the various services to the farmers through a minimum number of persons; organization of the county and field units so as to operate as a team Above all, the opinions and suggestions of farmers must be sought and considered in all phases of the Department's activities.

Mr. Deering has presented his arguments in a clear and forceful style. To many readers outside the U.S.A., he has revealed another side of the U.S.D.A., but it is quite clear that his views are identical with those of the Department which he criticises, namely, to do everything possible for the improvement of American agriculture. He differs only in the manner in which such a task should be carried out.—P. Mackintosh.

CHAPMAN, W. D. **County Palatine. A survey and plan for Cheshire.** 32 × 24. pp. 231. pls. 60 London: Country Life Ltd. 1948. 21s. **1174**

The Cheshire Planning Report has three main sections, the first explains the existing raw materials from which the county scheme must necessarily be formed, the second is the Plan itself " the resultant moulding of this material into a comprehensive and practical scheme for Cheshire " and the third contains detailed descriptions of the proposals for the various boroughs, urban districts and urban villages situated in rural districts. The work represents a very detailed analysis of Cheshire as far as the land, the people, their economic life in industry and agriculture and their social environment and public services are concerned.

The agricultural character of Cheshire has helped to determine the basic pattern of life in the County; heavy soils and climate make it preeminently a cattle and dairy farming region. The present farming economy is concentrated in the main on the supply of liquid milk, the change over from cheese production having taken place during the 19th century to meet the needs of a steadily growing industrial population.

The Land Utilization Map shows conditions in 1931-32. Some 55-6 per cent of the total acreage of the County (642,000 acres) are under permanent grass for the maintenance of dairy cattle and 25 per cent in arable farm land. War-time agricultural policy brought about the ploughing up of about one-third of the original total of permanent grass by 1943 and an increase in the wheat and potato acreages by 70 to 60 per cent respectively. With peace time conditions and relaxation of controls it is expected that there will be an appreciable reversion to pastoral farming.

The opinion is expressed in the Plan that the restoration of the lost industrial element is the key to the solution of the social problems of the rural parts of the county and not any revival of agriculture. Agricultural improvement might take the form of a revision of size of field and farm unit, to be studied in relation to various and development proposals, but it is more likely to be confined to improvements in farm management and the development of co-operative enterprise.

All the various data are discussed in great detail in Section I and are considered in Section 2 in relation to the future planning of the human occupations, standards of living, industrial and agricultural production, which has been so conceived as to guide future development into areas where the fullest benefit can be derived from the existing facilities or where they can be extended economically and efficiently. Full use has been made of the various cartographical methods for the representation of statistical data and the work is well illustrated with maps, diagrams and air and ground photographs.—G. M. Howe.

REPORTS

Relazione sull'attività del Laboratorio Crittogamico, dell' Osservatorio Fitopatologico e del Centro Studi sugli Anticrittogamici durante gli anni 1944 e 1945. [Report on the activity of the Cryptogamic Laboratory, of the Phytopathologic Observatory, and of the Centre for Studies on Anticryptogamics during 1944-45.] By *R. Ciferri*. *Atti Ist. bot. Univ. Pavia* Ser. 5. **5.** 275-321. 1946. **1175**

From a preliminary inquiry into the diseases of wheat a general classification showing the resistance of varieties most widely cultivated in Italy has been obtained. It is also indicated how the resistance of the varieties cultivated in the three main sectors of Italy (north, centre, and south) varies when the cultivation is shifted from the plain towards the mountains and *vice versa*. Some conclusions on premature ripening of wheat are also given.—E.B.

Relazione sull'attività del Laboratorio Crittogamico, dell'Osservatorio Fitopatologico e del Centro Studi Anticrittogamici durante l'anno 1943. [Report on the activity of the Cryptogamic Laboratory, of the Phytopathologic Observatory and of the Centre of Anticryptogamic Studies during 1943.] By *R. Ciferri*. *Atti. Ist. bot. Univ. Pavia* Ser. 5. **1 (4).** 279-364. 1944. **1176**

The different susceptibilities to root rot disease of several varieties of wheat are given. It is pointed out that the damage caused is serious only when the fungus attacks the collar of the culm and is more prevalent the earlier the infection takes place and also if the development of the plant is hindered by environmental conditions. There also appears to be a different virulence between one stock and the other. A list of wheat varieties showing their susceptibility to rust is given. The resistance of the the varieties cultivated in Italy is confirmed. The damages due to smut of wheat (*Tilletia*) are practically nil in central-south Italy and in the islands and generally small in north Italy, although in the latter zone during the last few years an increase of damage is reported. *Triticum durum* and *T. turgidum* are mostly cultivated in south Italy; the first appears to be immune to *Tilletia*, and the second shows a high resistance.

Almost every year the rice in vegetation is attacked by crustacea: *Branchypus stagnalis* and *Apus productus*. The most effective method of combat used in north Italy consists of drying the rice fields during May for a few days (generally two). A product based on calcium hypochlorite has also been used successfully.

The cultivation of *Arachis hypogea* at the Botanical Garden developed a disease characterized by brown spots on the leaves gradually increasing until desiccation of the leaves; flowering was consequently very low. It has been recognized as being due to lack of potassium: treatment with potassium sulphate has proved to be most efficacious.

The most dangerous parasite of sugar beet cultivations in the Piacenza zone is *Cassida nebulosa*. This insect can be fought with solutions or pulverizations of lead and calcium arseniates. It is advisable to use it against the adult larvae. Bait-plants can also be used in regions, such as north Italy, where sowing takes place rather late. At harvest some plants are left on the ground. In January-February of the following year they are transplanted (where it is more convenient). These plants will bud earlier than the new crop and all the Cassidae, which are butterflies at the beginning of spring, will gather around them. By spraying continually these plants with arseniates a great number of parasites will be destroyed.—E.B.

MALAYA. Report on agriculture in Malaya for the year 1946. By *F. Burnett*. pp. 85. Kuala Lumpur, 1947. [Director of Agric., Malayan Union] **1177**

Production of each of the major and secondary crops of Malaya for the period April to December 1946 is given in Section II and the various appendixes to the report. Some 684,005 acres were planted to wet padi and 105,635 acres to dry padi in the season 1945-46. The total yield was 225,044 tons of rice. In addition to the padi areas, land appreciably greater than in pre-war years was cultivated with a variety of foodcrops such as sweet potato, maize, ragi, groundnuts and all the well-known vegetables.

Plant introductions during the year included a variety of maize from Burma, pasture grasses, subterranean clover, and Indian dwarf cow-peas. Preliminary work has been restarted on pasture improvement trials, all pre-war experiments on grasses having been destroyed by the Japanese in their efforts to produce food. Various grasses and legumes, already shown to be promising before the war are being multiplied in preparation for planting up larger areas. These areas will be planted with various mixtures of species with and without top shade.

Early in the year a planting programme for Padi Experiment and Test Stations in the various States was formulated. It was decided to plant the more important strains that had been selected pre-war with seed received from Kedah where continuity of work had been maintained during the Japanese occupation. In addition Agricultural Offices were instructed to make a preliminary selection of popular local varieties for the purpose of forming foundation stocks for further selection. Details are also given of the season's work at the various experiment and test stations.—G.M.H.

AUSTRALIA. Twentieth Annual Report of the Council for Scientific and Industrial Research for the year ended 30th June, 1946. pp. 127. **1178**

Flax research has been undertaken by the Council for several years but in July 1945 this work was transferred to a new Flax Section and results of these investigations are included in the above report. Retting by water and chemical methods has been studied, and the whole question of water retting is being investigated from the fundamental aspect of the bacteria involved and their characteristics. Processing machinery investigations have included work on a straw butting attachment for the pick-up binder and deseeder. Fibre evaluation has been achieved by detailed chemica studies by physical tests and by agricultural fiel trials, and the work of extracting and evaluatin the fibre from the *Linum usitatissimum* straw i field trials was strongly emphasized. Specia attention was also paid to the determination o factors affecting fibre yield and quality and thes included soil preparation, time of sowing, weathe conditions during the growing period, percentag germination, manurial treatment, maturity at harvest, and after-harvest treatment of the crop.—M.E.E.

CANADA, Minister of Agriculture. Report of th Minister of Agriculture for the Dominion o Canada for the year ended March, 31, 1947 1947. pp. 257. **117**

During the year nearly 100,000 kg. of seed o a new saw fly-resistant wheat called Rescue, wa produced. In the spring of 1947 this seed wa available to farmers in areas of Saskatchewan an Alberta, where the saw fly is a serious menace Another new wheat, Redman (Regent × Canus) i being increased. It is resistant to stem rust, bun and black chaff and more resistant than Regent t leaf rust, loose smut and root rot. Experiment to develop a variety resistant to spring frosts, ar being conducted. Already, a hybrid type out of Reliance × R.L. 729 population has shown extreme frost resistance. This variety is now bein used as a parent in the crossing programme ; it i hoped to combine its frost resistance with th early ripening property of another high quality variety, in evolving a variety especially suited t certain northern areas.

In January, 1946, several thousand bushels o a new oat called Beaver were available at th Central Farm Ottawa, for seeding by easter farmers. It was derived from a cross betwee Vanguard and Erban, and combines stem-rust an crown-rust resistance. It ripens at the same tim as Erban, is stronger in the straw and has outyielded both parents in most tests. It is no sufficiently resistant to crown-rust to be relie upon, but Beacon is resistant to all races of crownrust so far indentified in Canada. A new oat called Garry, was bred for western Canada. It ha ability to resist all known Canadian races of stemrust and crown-rust, excelling both Beaver an Beacon in this respect.

Twenty-five varieties of linseed flax wer tested in 1946. During the year, Victory, a hig yielding introduction from North Dakota has bee licensed for sale and distribution in Canada Foundation stock seed of the fibre varieties Lira Dominion and Stormont Cirrus was transferred t Branch Stations for increase in the spring of 1946 A substantial quantity of seed resulted which wa to be used in 1947 to produce registered seed.—P.M.

Province of British Columbia, Department of Agriculture. Forty-second Annual Report 1947. Victoria. pp. 189. **1180**

The report of the Field Crops Branch includes the following :

Hybrid Field-Corn Tests. From tests conducted during the past few years certain strains have been recorded and are recommended for use in specified districts. Twenty-one separate strains were provided for test purposes. A corn trial with Canbred 150, Canbred 250 and Canad 240 was carried out to find the most suitable variety for the Armstrong District. All three strains are early maturing and therefore suitable for districts with a short growing season. In the tests outlined, Canbred 150, from one year's observation, seems to be the most suitable for this area, and it is thought that these very early varieties of corn could be of assistance in the livestock production of the Armstrong district.

Seed-Drill Survey. In the autumn, a survey was undertaken throughout the Province and will continue in the spring of 1948. The object of the survey is to check on the quality and source of the cereal grains being sown by farmers, particular attention being paid to number and kinds of weed-seeds in the samples. Information obtained will be used to encourage farmers to use only high quality seed as a preventative measure in weed control.

Soybean Trials. The recently introduced American variety Earlyana was tested on plots on Vancouver Island and Lower Mainland. Reports indicate that it is not early enough for local conditions. Some seed has been kept for a re-trial-plot and earlier seeding in 1948.

Weed-control. Increased use was made of 2,4-D as a weedicide. General recommendation on the use of this chemical for weed control are : susceptible annual weeds in cereal crops, flax and pastures can be controlled without crop injury with 8 to 12 oz. of 2,4-D acid of the sodium salt or 6 to 8 oz. of 2,4-D of the amine or ester salt per acre. Treatment should be made when the seeds are in the young growing stage. Perennials require higher rates—from 1 to 1.5 lb. of 2, 4-D and per acre at the bud or bloom stage. At these rates there is some danger of injury to the crop, especially flax. Indications are that Canada thistle, sow thistle and field bindweed may be greatly reduced in stand by application of 2, 4-D. Atlacide, Varsol and Sinox were also effective in controlling weeds in various crops.—P.M.

British Columbia Department of Agriculture. Agricultural statistics report. Year 1946. 1948. pp. 42. **1181**

The report contains statistics of the agricultural industries of the Province. They relate to areas of land under crops and under cultivation, production of the various crops and animals and animal products. Total area of the principal field crops in 1946 is given as 591,200 acres, an increase of 12,800 acres over 1945. Wheat production was 3,089,000 bu. (a yield per acre of 28.5 bu.) as compared with 2,544,000 bu. (a yield of 24 bu. per acre) in 1945. The yield of oats increased to 54.9 bu. per acre, from 45.1 bu. per acre in 1945. Similar yield increases are recorded for barley (38.2 and 31.7 bu. for 1946 and 1945 respectively) and rye (22.1 and 20.1 bu.). Production of all grains amounted to 8,709,700 bu. valued at $7,177,000 as compared with 7,028,000 bu. valued at $5,840,000 in 1945.—P.M.

Texas Agricultural Experiment Station. 59th Annual Report 1946. pp. 104. College Station, Texas. **1182**

Among the projects reviewed, the following are of interest :—

Loose smut of wheat. Annual loss due to this disease amounts to 360,000 bu. The disease can be controlled by an elaborate hot water treatment of the seed; but the most practical method of control is by the use of resistant varieties. Of the 250 varieties of hard and soft winter wheats, which have been tested at Denton, only Austin wheat was resistant to loose smut. Breeding is in progress to incorporate the resistance of Austin and other varieties into new rust and smut-resistant varieties adapted to all sections of Texas where wheat is grown.

Mechanical harvesting of corn. In 1942 a study was begun to determine harvesting characteristics and efficiency of the conventional type corn picker under Texas conditions, and to determine the relation of plant characteristics of corn to mechanical harvesting. It has shown that as the date of harvest becomes late there is an increase in field losses. There was a higher percentage of stalks down and lodged at the October harvest than in August or September. The stalks became progressively brittle and dry and broke easily ; the ear shanks also became brittle and ears snapped off and fell to the ground when the gatherers hit the base of the stalk, causing excessive losses in late machine harvesting.

Control of weeds in rice fields. Control was obtained in 1945 and 1946 at Beaumont, using 2,4-D. The chemical was applied by aeroplane, at 10 and 15 lb. per acre of 10 and 5 per cent dusts respectively, and aqueous sprays of 2 gal. of 7.5 per cent concentration per acre. No injury occurred to the rice, but it is emphasized that applications should not be made when rice is " in the boot" or when it is flowering.

Rice fertilizer studies. Applications of nitrogen to rice at the time of seeding were more profitable than similar treatments made at a later date. Acreage yield from plots receiving nitrogen at seeding was 2356 lb. as compared with 1792 lb. from plots fertilized just prior to the second flooding. Yields increased as the amouut of nitrogen used became larger; an application of 60 lb. per acre resulted in a yield of 3165 lb. per acre, and when 120 lb. of nitrogen was used, the yield was 4080 lb. per acre.

Cotton for mechanical harvesting. Three promising hybrids C.A. 89 A, A.A. 122, and Stormproof No. 1 were developed in 1945-46. Seed of these stocks is being increased to fill the demand for such cotton, for planting in a large area in western Texas especially, suited to mechanized production o cotton.

Safflower production. Safflower might prov a good alternative crop should reductions tak place in the future in the acreage of cotton, whea or grain sorghums. It was produced and harvested with wheat machinery. Acreage yields o 800-1200 lb. per acre appear to be possible in som of the drier areas of the state. A Septaria leaf spo disease is the chief hazard to production and wi prevent the use of the crop in the more humi areas of the State.—P.M.

NEWS ITEMS AND SCIENTIFIC NOTES

The World

Continued World Food Shortage 1183

World food shortages remain critical; many war-devastated countries continue at below pre-war consumption levels and large areas this year have been unable even to maintain the inadequate food consumption levels made possible during the 1946-47 crop years, according to a report submitted to the opening meeting on April 5, 1948, of the Council of the Food and Agriculture Organization.

Although there are reasons for some optimism over future food supplies on a basis of current crop prospects, the report says that natural uncertainties, low grain carry-overs, and reduced live stock numbers will delay increased food supplies. " The World still needs more than one good crop year," the Council was informed, " even to restore pre-war levels of food supplies in all areas." Grain crop losses in Europe (except the Soviet Union and four Danube basin countries) were called the " most important single factor in the present world food shortage." Although the estimated world total of exportable bread and coarse grains this year will exceed actual exports during the 1946-47 period, the report says that European imports may use up almost all of this increase and still equal little more than half the decline in European bread-grain production.

The Middle-East, like Western Europe, also suffered from drought, and the Far East, although showing a slight increase in output, remained below pre-war levels in the face of greater needs, especially in India.

In general, food supplies increased in Southern Hemisphere countries, a factor of great significance for the deficit countries of Europe and Asia. But inflationary trends have complicated problems of both national and international distribution, adding particularly to the balance of payment difficulties of countries dependent on food imports.

World supplies of fats and oils, allocated on a calendar year basis, showed " substantial improvement " over 1946, according to the report, but anticipated increases in requirements offer little prospect for further improvement next year.—*U.S. Information Service,* April, 1948.—G.M.H.

The World Wheat Situation 118

The general improvement in the world wheat situatio during the last twelve months is summarized in th following table reproduced from Broomhall's " *Cor Trade News* " of 21st January, 1948.

WORLD WHEAT POSITION AND PROSPECTS

	January, 1948. (Chicago Cash wheat 315.5 cents a bushel)	January, 1947. (Chicago Cash wheat 23 cents a bushel)
U.S.A.	Exportable wheat surplus 500 million bu.; other grains 50 million. Winter crop, December condition, 76 per cent, but Secretary Anderson talks of a 1300 million bu. winter and spring crop.	Exportable wheat sur plus 310 million bu. other grains 90 million Winter crop, Decembe condition, 93 per cent winter and spring cro eventually realized 136 million bu.
Canada	Exportable wheat surplus 190 to 200 million bu. Prairie moisture 41 per cent above average.	Exportable wheat sur plus 240 million bu. Prairie moisture belo average.
Argentina	Wheat crop 30 to 32 million quarters. Transport greatly improved.	Wheat crop 25.8 millio quarters. Transport poo
Australia	Wheat crop 210 million bu.	Wheat crop 117.2 mi lion bu.
Uruguay	Small surplus.	Small deficit.
Burma	Bumper rice crop, surplus exceeds 1.5 million tons.	Moderate rice crop, su plus say one million ton
India	Very good rice crop.	Moderate rice crop.

Russia	Total grain surplus about two million tons.	Grain surplus less than one million tons.
Balkans	Small grain surplus.	Moderate grain deficit.
Europe	Import needs 22 million tons. Most countries increased winter wheat and rye sowings; condition high.	Import needs 20 million. Small areas sown to winter grains; condition low. Heavy frost damage.

World requirements of wheat, though theoretically larger than last season, are offset by the increased surpluses available in the main exporting countries. The future course of prices, in so far as they can still respond to world influences, will depend largely on the progress of the European crops, which already show an advance in condition and in areas sown, compared with twelve months ago. Fertilizers are in more plentiful supply, and almost all Governments are paying growers higher prices for wheat to cover increased production costs. In some instances, it is true, the relationship of fixed price differentials between wheat and coarse grain seems to lack something in logic, but a very genuine attempt has been made to meet growers' price grievances. *N.F.U. Information Service.* March, 1948.—G.M.H.

Export Supply of Rice 1185

The International Emergency Food Committee of the Council of FAO has made recommendations to member governments for dividing the world's export supply of rice among claimant countries during 1948. Among important nations or dependent territories for which allocations are recommended are India, 825,000 metric tons; Malaya, 425,000 tons; China, 420,000 tons; Ceylon, 400,000 tons (including 29,000 tons to be shipped from Egypt in exchange for cereals); Cuba, 275,000 tons (including advance shipments from the United States in 1947); Indonesia (deficit area), 175,000 tons; Philippines, 54,600 tons; Hong Kong, 125,000 tons (a metric ton is approximately 2205 lb.).—*U.S. Information Service*, May, 1948.—G.M.H.

Raw Cotton Prospects 1186

The tentative estimates of world raw cotton production and consumption suggest that the 1947-48 world crop will fall short of world consumption by 1,790,000 bales and that the world carry-over on July 31, 1948, will be reduced to around 16,000,000 bales. Over the past three seasons world reserves have fallen by nearly 10,500,000 bales and it is clearly evident that, unless this trend is soon reserved by a further expansion in world production, a tight supply position cannot be far ahead.—*Emp. Cott. Gr. Rev.* January, 1948.—G.M.H.

Great Britain

Safeguarding Seed 1187

Figures from the Official Seed Testing Station at Cambridge show that for some years after the last war over ten out of every hundred samples of wheat received were visibly contaminated with bunt. But when mercury dressings were introduced that figure progressively fell, and for some years now has been only two per hundred or fewer.

There is an imperative national need to dress barley and oat seed also, for these mercury dressings are the only satisfactory means of controlling smut and leaf stripe diseases. Experiments have shown that treatment with a mercury dust reduced leaf stripe of oats from 34 per cent to less than one half per cent. Apart from checking disease, dry dusting makes for better stands and earlier growth and also ensures maximum yield. Some experimenters found that when dressed seed was sown the rate of seeding should be reduced, otherwise the plants would come up too thickly. Increases in yield varied greatly, but were often substantial, and ripening was slightly earlier.

This dry dusting is a simple job and much more effective than the old "wet" methods. It is a cheap insurance against corn being rejected for milling because it is contaminated with bunt. Many seed merchants sell seed already dressed. Farmers sowing home-saved seed should buy one of the several brands of approved organo-mercury dusts on the market and dress the seed themselves, using a machine for the work, if possible. The N.A.A.S. will give advice about suitable machines. —*London Corn Circ.* March, 1948.—P.M.

Scientific Liaison Offices 1188

The British Commonwealth of Nations Scientific Liaison Offices (London) have been opened on the third floor of Africa House, Kingsway, E.C.2. This is one of the measures to facilitate co-operation in the civil aspects of science within the Commonwealth decided on by the British Commonwealth Scientific Official Conference held in London in 1946. For a number of years several of the Commonwealth countries have maintained scientific liaison offices in London, and these, together with the ones now being established, will have their headquarters in Africa House. Each of these offices will continue to operate as in the past, retaining complete independence of action; but the convenience of occupying adjacent premises will facilitate co-operation between them on matters of common interest. For ease of reference to the group of independent offices as a whole, the title given above has been chosen, with the abbreviation B.C.S.O. (London) for common use. The offices taking part in the scheme are those of Australia, Canada, Central African Council, India, New Zealand, South Africa and the United Kingdom. Pakistan and the Commonwealth Agricultural Bureaux will be represented, and the Overseas Liaison Division of the U.K. Department of Scientific and Industrial Research will work in Africa House. In Washington the scientific liaison offices of the Commonwealth countries are associated under a similar scheme. *Nature, Lond.* June, 1948.—M.H.

Eire

Compulsory Tillage 1189

It is noted in "*Foreign Commerce Weekly*," March 20, 1948, that the new Minister of Agriculure recently announced the intention of the Government to abandon the policy of compulsory tillage after this coming crop year. The Compulsory Tillage Order was adopted in 1940 and made it necessary for landholders to turn much of their grazing land into cultivated holdings.—P.M.

France

Crop Areas 1190

Official estimates of crop areas in thousands of acres (compared with those of 1947 and with 1938, which was a good year): wheat 10,606 (8232 and 12,634); oats, 6143 (— and 8015). Condition (compared with 1938): wheat 77 (68); rye 77 (67); oats 73 (64); barley 75 (64)—*London Corn Circ.* May, 1948.—G.M.H.

Belgium

Beet Research Subsidy 1191

The I.B.A.B. (Institut Belge pour l'Amélioration de la Betterave) has been granted a subsidy of 2.352,000 francs (£13,326) to continue its researches into the cultivation problems of sugar beet.—*Internat. Sug. J.* May, 1948.—G.M.H.

Holland

Rye-Wheat Hybrids 1192

Scientists from the Plant Breeding Institute of the Agricultural University at Wageningen, Holland, have obtained very promising results in experiments in crossing wheat and rye. It is expected that large-scale planting of the new cereal resulting from these experiments will take place this year in Holland. Dutch scientists used a substance known as colchicine, a poison obtained from the roots of the colchicum plant, which has the effect of doubling the number of chromosomes present.

The advantages of obtaining a satisfactory cross between wheat and rye are very great, states the International Federation of Agricultural Producers. The result might be a cereal which could be grown on poor rye soil, and which would contain a high nutritive value. Various hybrid crosses have been obtained in the last 50 years but nearly all have remained sterile.

Dutch research has produced a variety which is at least partially fertile, and large-scale planting can now be undertaken in order to discover whether further experiments will enable a cross to be produced that is suitable to the poor rye soil, of which there are more than 550,000 acres in Holland alone.—*Fmrs' Wkly Bloemfontein,* March, 1948.—G.M.H.

Sweden

Seventh International Botanical Congress 1193

The attention of Argentine botanists is drawn to this Congress, to be held in Stockholm in 1950. *Rev. argent. Agron.* March, 1948.—G.M.R.

Sugar Beet Disease 1194

At a meeting of Lund Botanical Society on 26 September, 1947, Dr. K. Björling gave an address on "Virus yellow smut in *Beta.*" The disease, which has caused considerable injury in recent years, is transmitted by aphids. The incubation period is approximately three weeks. The pathogen overwinters in the stecklings to be used for producing seed the following year. In infected plants the sugar content of the roots is reduced considerably. No resistant beet strains have yet been bred.—*Bot. Notiser.* 1948. Hafte 1.—R.P.J.

U.S.S.R.

Agriculture in the extreme North 1195

The Institute of Polar Agriculture and Animal Husbandry consists of ten plant breeding stations in addition to stations devoted to animal breeding. In 1945 the area of open ground under agriculture in N. lat. 65-72° (tundra and northern forest/tundra) was 871 times that of 1926; in the southern part of the forest/tundra and northern taïga (62-66°N.) the increase in 1945 was 102 times that of 1926; and in the taïga zone (57-62°N.) 5.5 times. The crops grown include certain varieties of oats, barley, spring wheat, and rye, with root crops and vegetables.

It is thought that varieties of tobacco, *Camelina*, flax, hemp and buckwheat may be grown in the extreme north. *Sec. seljs. Hoz.* No. 3. 1947.—M.H.

Varietal resources 1196

The Tuva autonomous province is a region of high mountains, up to 2 km. above sea level, and deep valleys, characterized by extreme variations of temperature. Special local forms of a great number of familiar plants exist there; they tend to be characterized by cold and drought resistance, early maturity, and tolerance of sharp temperature changes and provide a promising source of plant breeding material. An expedition was sent in 1945 to study and collect the local forms of cultivated plants. Hundreds of hectares of wild yellow lucerne were found, and proved to be high quality and suitable for use as seed. The local wheat was unusually high in baking quality, yield and earliness and other interesting material collected included a number of forms of herbage grasses, millet and cucurbits. *Selek. Semenovod.* No. 11-12. 1946.—I.Z.

Africa

Oil from Cotton 1197

Experiments have been carried out at Chad of extraction of oil from cotton grains.—*Cot. Fib. trop.* Sept., 1947.—E.B.

South Africa

Agriculture 1198

A noteworthy crop change has been the increase in peanut production. With the emphasis which is being placed on production of oil-bearing crops and the encouragement given to the planters by the Government-guaranteed price, the 1947-48 peanut crop may be doubled. Some change from maize to oil-bearing plants is in prospect because the Government-guaranteed price for maize has been reduced.

The soil-conservation programme is to be assisted by the Government by loans, with subsidies and rebates up to 50 per cent of the cost of fulfilling the programme for each farm. During the first year of the programme, 108 soil-conservation districts have been announced covering 13,000,000 morgen (1 morgen = 2.1 acres). The response of the farming communities to the programme has been remarkable.—*Foreign Commerce Wkly.* Mar., 1948.—P.M.

India

Farm Tractors 1199

The need for farm tractors is noted in *Foreign Commerce Weekly*, Mar. 13, 1948. Bombay dealers believe that at least 15,000 could be sold if they were available. The 1948 supply is estimated at 1500. It is reported that nearly all of the orders have been placed with Canadian manufacturers. Individual purchasers are reported to be paying the full sale value of tractors that are to be delivered in from 18 months to 2 years. Farm equipment has been placed on the free list and import licences reportedly may be obtained by dealers to 5 days.—P.M.

New Guinea

Oilseed Production 1200

It was reported during March, 1948, that the Australian Cabinet had approved suggestions by the British Food Mission that New Guinea could be developed during the next five years to produce groundnuts, coconuts, and tea in quantities equal to Africa. It is understood that some British experts may be switched from Tanganyika to New Guinea.—*Crown Colonist*, May, 1948.—G.M.H.

Australia

Flax Production 1201

Flax is grown in South Australia (about 3450 acres), Western Australia (2000 acres) and the western districts of Victoria. The total area sown in the 1947 season was 18,000 acres, a big drop from the wartime peak of 61,000 acres. During the war years, however, the demand for flax was so urgent and important that it was grown under subsidy on land and in localities not entirely suitable, which accentuated the effect of seasonal conditions. In 1941/42 more than 65,000 tons of straw were obtained from 54,000 acres, yet in 1944/45 only 28,000 tons of straw were produced from 63,000 acres. Now the industry, with the help of mill managements and the Flax Production Committee, appears to be settling down to efficient and profitable production in districts well-suited to the crop. The average yield for the season is expected to be one ton of straw to the acre though in Victoria better results seem assured. Some growers rotate barley and onions with flax, the land being sown to flax only every fourth year.—*London Corn Circ.*, March 8, 1948.—P.M.

Tasmania

Cressy Research Farm 1202

In addition to pasture research, experimental work has been carried out on flax, oats, wheat, barley and field peas. The recommended seeding of flax at 70 lb. per acre has been confirmed and a rust resistant variety W.A.D.A. found to give increased yields and score one grade better quality fibre over all the older varieties in the 1947 trials. A superior oats strain has been obtained from local Algerian crops, released and readily accepted by the farming community. The variety trials are divided into two sections the fed-off trial and the late sown section. Wheat expermental work has concentrated on the testing of various mainland and New Zealand varieties for their suitability under Tasmanian conditions, and comparative yield trials of Tasmanian cross-breds not yet named. The main work with barley has been the multiplication of the three main varieties of malting barley grown in the State—Golden Archer, Plumage Archer and Goldthrope. Single plant selections of blue and grey peas have been isolated, tested and released to growers. *Tasm. J. Agric.* 19. 1948.—G.M.H.

Canada

Heavy Invasion of Grasshoppers 1203

This year the heaviest and most widespread attack of grasshoppers is expected in Saskatchewan since 1940. Reports have come from 170 municipalities to Dominion Department of Agriculture entomologists telling that grasshopper egg concentrations in sufficient numbers constitute a serious threat to spring crops. The infested area extends from North Battleford south to the international boundary and from Alberta east to Wynyard, Regina and Estevan. The intensity of infestation varies from very light and patchy to continuous and severe. In the severe areas, a light to moderate infestation occurs throughout stubble fields, becoming heavy on ditch banks, roadsides, headlands and dry slough margins.

Good baiting campaigns, carried out in the spring before grasshoppers leave the hatching areas and spread into the young crops, will make for effective control in most areas. In addition, the hoppers should be destroyed while preparing new summerfallow to prevent them oving to nearby crops. Even small populations of eggs if allowed to hatch throughout a stubble field will cause considerable marginal damage to adjacent fields.

The spring control programme should be followed by further baiting during July and August where grasshopper concentrations occur before their eggs have been deposited to prevent an increase in infestation for 1949.—*Fm News*, March, 1948.—P.M.

2-4, D not cure-all 1204

The expansion of the market for 2-4,D in Canada has been phenomenal. In 1947 about 500,000 acres of farm land in Western Canada were treated with the new chemical. In 1948, according to an estimate of a leading manufacturer of chemicals, from 5 to 10 million acres will be treated. Meanwhile weeds are causing an annual loss to farmers in Canada of more than $200,000,000. There are on record some convincing examples of the enormous damage to crops caused by weeds and equally convincing evidence of the increased yields, when weeds are controlled. Those who have made a study of the effectiveness of 2-4,D as a weed control agent, feel confident in recommending it for the control of weeds, such as mustards, stinkweed and ragweed in cereal crops. At recommended rates an increase in yield in proportion to the number of weeds removed will more than pay for the cost of application. On the other hand, there are weeds, which may be resistant to 2-4,D.—*Fm News*, March, 1948.—P.M.

Value and Production of Field Crops **1205**

Statistics published by the Dominion Bureau of Statistics show that the gross value of the principal field crops produced in 1947 on Canadian farms is now valued at $1315 million. This is the fifth highest gross value recorded since the series was set up in 1908. Crops making the largest individual contributions to this total value are wheat, valued at $398 million, hay and clover at $242 million, oats at $190 million and barley at $125 million. The potato, flaxseed, rye and alfalfa crops are valued at $92, $64, $42 and $39 million respectively, with other crops valued at $123 million, making up the balance.—P.M.

Sunflower Production **1206**

A great shortage of vegetable oils and fats still exists in the world to-day and much is being done to develop additional sources of this important commodity. In Canada, growing sunflowers on a commercial scale has been developed chiefly in the Province of Manitoba, where 23,000 acres were devoted to this plant in 1947. The yield per acre averages 800 lb. so that the production of sunflower seed for 1947 has been estimated at 9200 tons. The production of sunflower seed oil in Canada in 1945 was 5,098,480 lb. In addition to the domestic production, quantities of sunflower seed oils are imported into Canada; in 1946 imports amounted to 14,866,300 lb. with Argentina supplying most of this quantity. *Fm News*, March, 1948.—P.M.

Practical Uses of Sunflower **1207**

In addition to being an ornamental plant the sunflower has many other practical uses as almost every part of the plant can be utilized in some way. The seeds that make up the face are high in oil content (20 to 32 per cent.) The oil is light gold in colour and ranks close to olive oil in texture and flavour. It is used in the manufacture of soap, paints, shortening and fish canning. Once the oil is extracted, the oil cake is highly valued as a stock and poultry feed. In some cases the whole plant is cut up and stored in silos in a manner similar to corn. Both the yellow ray-like flowers and the seeds themselves are an excellent source of honey and the pithy seed containers in some countries are dried and made into blotters. The inner part of the stalk is used in the manufacture of fine writing paper, while in some European countries the seeds are eaten in the same way as peanuts are eaten. *Fm News*, March, 1948.—P.M.

New Spring Wheat for Eastern Canada **1208**

A new spring wheat named Cascade especially developed for growing in Eastern Canada by the Cerea Division, Central Experimental Farm, Ottawa, is now available to farmers. Limited quantities of seed of the new variety, for seeding the spring of this year, are being offered for sale by the Cereal Division of the Centra Experimental Farm, the Dominion Department of Agriculture has announced. Cascade is a white, semi -har beardless wheat and under exacting tests over the past few years has proved to be of excellent yielding ability. It won first prize at the 1947 Royal Winter Fair, a similar prize at last year's Ottawa Winter Fair, and 4th prize at the 1947 International Grain and Hay Show, Chicago. Cascade adds another triumph to the long list already won by the plant breeders of the Experimental Farms Service, Dominion Department of Agriculture.—*Fm News*, February, 1948.—P.M.

U.S.A.

New Land for Farms **1209**

Draining, clearing and irrigation are constantly increasing the productive acreage. Tractors, bulldozers and other power machinery are taking the leading rôle in the present land development; more than one-third of the nation's farms now have tractors, compared with only 14 per cent in 1930. The present flood control, drainage and irrigation projects at present under way will enable farmers to have larger farms in many areas, or will go into new farms opening new farm opportunities to young farm people.

Federal reclamation projects now irrigate over a million more acres than in 1940. The 1945 Agricultural Census indicates that land irrigated from all type of projects both public and private, increased by 2.6 million acres between 1939 and 1944. However, much of this was fallow, idle and pasture land already subject to irrigation, or dry cropland to which water was made available.

In the past 25 years between 35 and 40 million new acres of cropland and improved pasture land have been drained, cleaned or irrigated. This does not include those acres of the western grasslands which have been ploughed up and cultivated. Many of the new acres have gone to increase the acreage of old farms. Since the early 1920's the average size of farms has increased from 148 to 195 acres. *Agric. Situation.* Jan. 1948.—P.M.

Soybean Laboratory **1210**

In USDA, Misc. Publ. No. 623 the work of the U.S. Regional Soybean Laboratory, Urbana, Ill., and its co-operating agencies in twelve North Central and twelve Southern States is described. It covers the accomplishments of the research work, improvement of soybean varieties, disease control studies, storage of soybeans and the establishment of standards and studies of composition and use.—P.M.

Argentina

Sunflower Seed **1211**

The official regulations for certifying sunflower seed demand a germination capacity of 94 per cent and admit the following percentages adulteration, etc. : damaged grains, 1 ; empty grains, 3 ; extraneous matter and rotten grains, 1 ; black grains, 1 ; moisture, 10. Should germination capacity be less than 94 per cent but more than 80 per cent, the grower or seedsman may sell the seed provided the buyers are previously informed of the deficiency. No seed of germination capacity of less than 80 per cent may be sold. *Noticioso* Sept. 1947.—G.M.R.

Locust Control 1212

An historical account of measures taken to control locust attack in Argentina is given by Engineer J. B. Marchionatto, Director General of Plant Health and Locust Control, in *Ciencia Invest.*, January, 1948. Locusts have always been a cause of serious damage to lands and crops in Argentina, but no scientific study of the pest was made until 1933, when a Committee to investigate the problem was set up by the Ministry of Agriculture. Since then a large amount of information has been acquired on the life cycle of the locust, its migrations, the periodicity of its attacks, and the best methods of control, whether biological or chemical, at different phases of its existence. Action is now organized and subsidized throughout the country ; the education of the countryman in regard to the locust has been undertaken ; and constant contact and co-operation with the other South American countries is maintained, partly through inter-American conferences, the last of which was held in 1946.

The Ministry's weekly, *Noticioso*, records vigorous measures in 1947, when the Argentine army and navy co-operated in intensive locust destruction by sending out teams of men in lorries, jeeps, etc., to affected regions, thirteen such teams with 115 men leading the way in October. *Noticioso* Sept. and Oct., 1947.—G.M.R.

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FIELD CROP ABSTRACTS

LAND UTILIZATION AND MANAGEMENT

HOWE, G. M. **Air photography and agriculture.** *Farming* **3.** 208-9. 1948. [Commonwealth Bureau of Pastures and Field Crops, Aberystwyth] **1213**

A brief survey of some of the possible applications of aerial photography to agriculture is given. The applications include farm planning and the study of land utilization, soil types, farming systems, vegetation and drainage. An air atlas of Britain and a central photographic library are recommended.—G.M.H.

PEGLION, V. L'aspetto agronomico del problema antimalarico. [**The agronomic aspect of the anti-malaria problem.**] *Ital. agric.* **84.** 3-9. 1947. **1214**

The drainage of large areas of Italian soil covered by salt water, with the aim of bringing new land to cultivation, showed a proportional reduction in malaria. It has been established that, at least under the Italian conditions, *Anopheles maculipennis elutus*, the mosquito which propagates malaria, develops in salty water.

In the present article problems of soil reclamation, irrigation water, presence of *Anopheles* and malaria, in relation to salinity, are examined.—E.B.

WHYTE, R. O. **The fodder resources of Cyprus.** A report of a survey made in autumn, 1945 and spring, 1946. 1948. pp. 44. **1215**

The problem of providing fodder is reviewed on the background of general land utilization in this Mediterranean environment. The natural grazing grounds in the maquis and other characteristic types of vegetation are seriously overgrazed and erosion is rampant. The arable land is low in fertility because of the centuries old cereal/fallow system of cultivation. The chief recommendation is that forage crops should wherever possible be grown in the fallow year and grazed or taken for hay. A shift in the pressure of the grazing animal population from the natural vegetation to the arable land will reduce overgrazing on the former and improve the fertility of the latter.—R.O.W.

PALESTINE GOVERNMENT. **The fodder resources of Palestine.** A report of a survey made in autumn, 1945 and spring, 1946. By *R. O. Whyte.* 1948. pp. 31. **1216**

The fodder problem is reviewed in relation to land utilization in the Arab and Jewish types of agriculture. There is a great development of fodder cultivation under irrigation to provide fodder continuously throughout the year for the dairy herds of the Jewish settlements. Production is high but the price of milk is said to be uneconomic. Both fodder production and animal husbandry are on a low plane of efficiency in the Arab districts.

Improvements in fodder resources and in the animals which are to use them must go hand in hand. The problem of achieving improvements in fodders in Arab agriculture without irrigation is a most difficult one. The fodder potentialities of the different land-use types are reviewed. As in Cyprus, a transference of the pressure of animal populations from overgrazed rocky hillsides to the arable land would be of great benefit to both ; the success of reservations in the Judaean Hills indicates that, so remarkable are the powers of recovery of the natural vegetation, the removal of grazing animals for a period of 20 years would lead to almost complete regeneration of a protective vegetative covering.—R.O.W.

UGANDA Protectorate. **A development plan for Uganda.** By *E. B. Worthington.* With a foreword by His Excellency the Governor of Uganda. 1946. 26 × 20. pp. 124. Entebbe: Uganda Protectorate Govt. Press. 1946. 2s. 6d. **1217**

His Excellency the Governor of Uganda, in his foreword to the Plan, examines the premise of the continuance in that country of the system of peasant agriculture based primarily upon small individual holdings in so far as it is " a vital and limiting factor in any discussion of the potential wealth of the industry." The possibility of large estates or concessions owned and operated by Europeans or collective farms on the Russian model are discussed but for reasons given Uganda must remain primarily a country of peasant agriculture. The memorandum continues to examine how best to develop the country and exploit its natural wealth with this as a limiting factor.

The total funds available for expenditure during the next ten years are estimated and a discussion is given on each of the productive services (geology, hydrology—water is the most important of Uganda's natural resources—agriculture, etc.), the social services and common services (transport, police, etc.). The agricultural policy is to protect, improve and develop the natural resources, aiming at the most economic use of the land and labour available. This is coupled with the provision of an adequate and nutritious food supply for the people and the encouragement of maximum production of economic crops for export or of raw materials for local industry. Water supplies, tsetse fly and man power are factors which will limit progress to these objectives, but each is given due consideration in the provisional scheme of expenditure which will be required for the various projects.—G. M. Howe.

SMITH, T. L. **Water supply in the agricultural areas of Western Australia.** *Aust. Geogr.* **5.** 115-56. 1947. **1218**

This is a factual report of an investigation carried out by the Regional Planning Division (Dept. of Post-War Reconstruction) into a proposal by the Government of Western Australia for a water supply scheme for that State. The scheme is designed to serve a major part of the agricultural areas of Western Australia. The report is divided into three parts: (1) Resources; (2) History of Development; (3) Amenities and Social Aspects, and has maps of Western Australia showing generalized relief, major soil zones, generalized land use and types of farming, etc.

The coastal plains, which are dominantly podsols, are used primarily for dairying and fruit growing. The scarpland zone, dividing the coastal plains and the inland plateau, includes the chief forest areas of the State. The soils here also are largely podsols. On the inland plateau is the sheep belt, which gradually merges through a mixed wheat and sheep area into the wheat belt. The soils of this region are dominantly red-brown earths and terra rossas. Further inland lie the marginal and semi-marginal wheat lands.—G.M.H.

CANADA, Department of Agriculture. Publ. 742. Tech. Bull. 45. **Soil survey of Stanstead, Richmond Sherbrooke and Compton counties in the province of Quebec.** By *D. B. Cann* and *P. Lajoie.* 1942. pp. 59. [Received 1948]. **1219**

In addition to reporting the results of the soil survey, this publication deals with the history of local agriculture, present land utilization, and vegetation (a " man-conditioned climax "), as far as pastures are concerned. The tendency in crop production between 1931 and 1940 was away from hay, with an increase in maize for silage, and in root crops. The most frequent grasses are *Agrostis alba, Festuca rubra, Poa pratensis* and *Danthonia spicata*; *Trifolium repens* is the most frequent clover, with also *T. pratense* and hop clover (*T. agraricum*).—R.O.W.

CANADA, Department of Agriculture. **Soil survey of Shefford, Brome and Missisquoi counties in the province of Quebec.** By *D. B. Cann, P. Lajoie* and *P. C. Stobbe.* 1947. pp. 84. **1220**

This is the second report dealing with the soils of the Eastern Townships of Quebec Province and like the first deals also with the characteristics of the area, land uses and agricultural methods, and crop adaptation and land-use capability classes. The main problems are stoniness, relief, drainage, fertility, acidity and susceptibility to erosion. Soil erosion is of increasing importance in the area. Much topsoil is being lost annually and specific management practices are necessary for certain soil types.

Prior to settlement the natural vegetation of the surveyed area consisted of deciduous and coniferous forests. The chief pasture species are as in the first survey referred to above.—R.O.W.

FARMING SYSTEMS

GLENTANAR, Lord, and YOUNG, R. D. **Food production from hill pastures.** *Scot. J. Agric.* **28.** 4-9. 1948. **1221**

An account is given of the attempt that is being made to increase the usefulness of the Glen Tanar Estate, Deeside, for producing human food. The major part of the additional food required by the outwintered cattle is provided by the arable land of the home farm which has been extended from 130 to 270 acres by ploughing up old pastures and reclaiming areas where suitable soil conditions existed. A nine years rotation is practised on two separate in-farm sections, namely: swedes/potatoes/cabbage/kale and mangolds/oats undersown with catch crop/mashlum for ensiling or harvesting/turnips/oats undersown with rotation grasses/grass for four years. The out-farm section, made up of widely separated areas, is farmed on a seven years rotation as follows: turnips for sheep feeding/rape for sheep feeding/oats undersown with grasses/grass for four years.

Hay is made by the Norwegian method on temporary fences, and according to the season, a proportion of rotation grass is ensiled. Reseeding certain areas of heather or heather-and-grass moor has been carried out both with ploughing and without it; in the latter instances the heather has been burned, the surface scratched, lime and phosphate applied, seeds sown, and the ground harrowed and rolled. Special tools have been devised for this work and a crawler tractor has been used. Experimental work in this direction is continuing, especially in producing a soil consolidation implement which will operate where an ordinary roller could not be used.—G.M.H.

RAINGEARD, J. Le paysannat indigène au Congo Belge. Essai de la Station I.N.E.A.C. de Gandajika. [**Native peasantry in Belgian Congo. Essay of the Gandajika I.N.E.A.C. Station.**] *Cot. Fib. trop.* **3.** 29-32. 1948. **1222**

Agriculture in Central Africa is still semi-nomadic: the natives set fire to the vegetation during the dry season, the land is cultivated until exhausted and then abandoned. New lands are then sought. In the Belgian Congo successful attempts have been made to settle the native on the land. At Gandajika, under the supervision of the Station, a rotation of 5 years cultivation with cotton/beans/arachis/maize/and manioc and 7 years fallow land has been tried out.—E.B.

CROPS AND CROP PRODUCTION

VALLE, O. Aktuella växtodlingsproblem i Finland. **[Topical field crop problems in Finland.]** *LantbrVeck. Handlingar* 1945. pp. 21. [Received 1948] [Professor, Cent. Agric. Res. Sta., Tikkurila, Finland] **1223**

An account is given of the research and experiments on the growth of oil plants and the Russian dandelion (*Taraxacum kok-saghys*) conducted by the Crop Husbandry Department of the Agricultural Research Station at Tikkurila during the war years.

Two new Finnish varieties of oil flax (*Linum usitatissimum*) have been produced, namely, Vaanila and Ti 0774. Vaanila originates from Argentine oil flax, but is taller and therefore better able to suppress weeds than the shorter-stemmed Argentine variety. Ti 0774 has been produced by the Crop Husbandry Department from Finnish flax. It is 10 days earlier than Argentine oil flax but gives a seed yield which is only 5 per cent lower. The seeds are small, but very rich in oil. The use of this early linseed enables oil seed to be grown even in Central Finland.

Trials of the following oil plants have been made at nine places: Argentine oil flax, the Netherlands flax variety Concurrent, white mustard (*Sinapis alba*), poppy (*Papaver somniferum*), leaf mustard (*Brassica juncea*), annual turnip rape (*Brassica rapa* var. *oleifera* f. *annua*, an Argentine variety), and *Camelina sativa*. The oil content of the seed yield at the different places was determined in 1944. Annual turnip rape and *Camelina sativa* were found in Argentine linseed, in which these plants grow as weeds. Experiments were made to determine the effect of different harvesting dates upon the quality of *Sinapis alba* (six different dates tested) and *Brassica juncea* (fourteen dates).

During the war the seed of some weed species also was studied for fat and crude protein content. The fat content of the dry matter was highest in *Stachys palustris* (46.4 per cent), *Galeopsis* (42.2 per cent), *Erysimum cheiranthoides* (39.7 per cent), and *Thlaspi arvense* (35.9 per cent.).

Experiments with *Taraxacum kok-saghys* in Finland have been in progress since 1943, when forty-six different local trials were initiated, the northernmost within the arctic circle. The results of the first year's trial in the autumn of 1943 were as follows: root yield, 2759 kg. per ha.; rubber content, 6.8 per cent of the dry matter; and yield of rubber, only 45 kg. per ha. In experiments made by the Crop Husbandry Department at Tikkurila in 1944 to test different times of sowing and harvesting, the best yields exceeded 80 kg. per ha. Early sowing (in May) proved necessary for obtaining the highest possible yield. According to the harvesting trials, the Russian dandelion should be harvested late in October, before the ground freezes for the winter.—O.V.

WIKLUND, K. Något om norrländsk utsädesodling och växtförädlingsverksamhet. **[Cultivation of grain crops and plant breeding work in Norrland.]** *Svensk Frotidn.* **16.** 42-6. 1947. **1224**

As in Norrland natural prerequisites for crop cultivation vary within wide limits, and even within restricted areas conditions may show considerable differences, breeding to produce varieties suitable for different localities is of the first importance. The Västernorrland Branch Station of the Swedish Seed Association is responsible for breeding work for central and south Norrland. Supplementary tests of material are conducted at 3 sub-stations.

The land varieties of the different grain crops which were grown in Norrland were early (peas constitute in part an exception) but they gave low yields, had weak straw and were of poor quality.

As a result of breeding work which was begun at Luleå in 1906 Stella barley was obtained through selection from land barley from Hälsingland. The well-known grey pea variety Bothnia was the result of direct selection within a grey pea variety from Ragunda in Jämtland. Vega and Dore barley varieties were obtained through selection in land varieties.

Combination breeding has resulted in the production of a large number of valuable varieties —Orion oats, Same oats, Sirius oats, Edda barley, Vesta grey pea, etc. The possibilities of seed grain production in Norrland are discussed.—R.P.J.

EINAUDI, L. La situazione dell' agricoltura. **[The agricultural situation.]** *Ital. agric.* **84.** 211-6. 1947. **1225**

The gross amount of agricultural production, compared with that in 1938, was in 1945, 57 per cent, and in 1946, 76 per cent. The decrease in production in relation to pre-war arises from various factors which can be grouped in two principal categories: (a) factors consequent to war and (b) price policy and trade regulation in force during the last few years. In the first category the following factors are included: land reclamation works destroyed and not yet replaced, inadequate supply of fertilizers, inadequate number of animals required for agricultural work, deficiency of machinery (worn out or destroyed and not yet replaced). As to the second category, the maintenance of artificial prices in relation to agricultural products causes a way of production which is inconsistent with the needs of the country.

Cereals amount to about one-third of the whole agricultural production, wheat being by far the most important. The average wheat crop of 1937-1938 was 8,074,000 tons; production in 1945 was 4,175,500 tons and in 1946 6,125,100 tons. This decrease is partly due to a fall in average yield (from 1.63 tons per ha. in 1938 to 1.32 tons per ha. in 1946) and partly due to reduction of the wheat cultivated area (in 1945 and 1946 85.3 per cent of the area cultivated in 1938). In regions where the wheat demand is very high, like Campania and Liguria, there has been no relevant decrease in wheat production (neither in area nor in average yield). The production has remained good in regions where small holdings predominate (Central Italy), and in regions very favourable to wheat cultivation (Emilia, Venetia), while the highest reduction has taken place in zones under intensive cultivation of an industrial capitalistic nature (plain of Lombardy and Piedmont) and where it was easy to move to other productions (towards sheep rearing in South Italy). The high degree of technical progress, which in the past years has contributed to increase the average yield per unit, is mostly found in the large industrialized concerns which are now more hindered by the present control policy.

In 1925 to encourage wheat production a Custom's duty was fixed on wheat (which was imported in great quantities mainly from U.S.A. at a lower price than Italian wheat). To-day the situation is reversed. The Italian wheat is kept artificially at a lower price than the imported American wheat. The solution therefore resides in a policy which will stimulate production and bring up prices to international standards.—E.B.

FRENCH, M. H. **Local millets as substitutes for maize in the feeding of domestic animals.** *E. Afr. agric. J.* **13.** 217-20. 1948. [A.R.I.C., E. Afr. Prod. and Supply Council] **1226**

This article gives an indication as to what classes of live stock and in what quantities millet grains can be successfully fed, and also describes the results of experiments conducted at the Mpwapwa Veterinary Research Laboratory, Tanganyika, on the feeding value of local white millet (*Mtama*) and bulrush millet (*mawele*). It is shown that provided care is taken to see that the ration remains properly balanced and that the millet does not form an unduly high proportion of the total ration, locally grown white and bulrush millets can be used very successfully for replacing maize in the rations of all classes of live stock. For certain classes of animals and under certain conditions of feeding they are fully the equivalent o maize but for practical purposes these millet grain are regarded as having 90 per cent of the feedin value of maize.—G.M.H.

SHEN, T. H., and MEI, C. F. **The production an marketing of wheat and the food problem i China.** *Mon. Fmrs Bank China* **8.** 3-6. 194 **122**

Chinese food production and consumption ar discussed in terms of the pre-war, war-time, an post-war situations. A five-year plan worked ou by the Ministry of Agriculture and Forestry i July, 1946 with the object of increasing food production includes policies to (a) increase the outpu of grains, (b) increase livestock products by usin soybeans, rapes, etc. as fodders, (c) increase th per unit production of wheat in Central and Nort China, (d) maintain the normal output of rice, (make full use of soybeans and increase their production in the north-east. It is intended to mak the north-east of China the main food producin area for the whole country.

Based on climate and wheat variety, Chin may be divided into seven wheat producing regions (1) the Yangtse Valley, (2) the Huai Ho Valle (3) the eastern section along the Lunghai Railway (4) the middle part of Sheni, (5) the northern part of Honan and Shantung, (6) the middle parts o Hopei and Shansi and (7) the spring wheat zone o the north-east. The improvement of wheat commenced in 1912 and to date more than half of th 60 improved varieties have been used for increase production. It is estimated that output from thes improved wheats is 12 to 20 per cent higher tha that from ordinary stock.—G.M.H.

UNITED STATES Tariff Commission. **Agricultural pastoral, and forest industries in Argentina.** 1947 pp. 96. **122**

A valuable statistical review of Argentin agriculture and the natural and economic conditions governing it is presented by the Unite States Tariff Commission. Principal crop plants pp. 26-44.—G.M.R.

ECONOMICS OF CROP PRODUCTION

EDINBURGH AND EAST OF SCOTLAND COLLEGE O AGRICULTURE. Bull. No. 9. **Economic aspect of farm mechanisation. Costs and performanc of tractors and combine harvesters in east an south-east Scotland.** By *D. Witney* and *H Christine McIver.* 1947. pp. 46. **122**

A study of costs and performances of differen types of tractors and combine harvesters unde varying conditions and for varying crops. Information relates to 1944-5 and 1945-6, wit capital investment in mechanical equipment considered over a 10 year period. Interesting results are presented and a long-term approach is made to this complex problem. Labour and other problems lead authors to the conclusion that mechanisation of farming operations will increase, and the need for adequate technical knowledge is stressed. [See also *Fld Crop Abstr.* 1, *Abs.* 68 and 965.]—T.G.J.

EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE (Department of Economics). Bull. No. 12. **Report on financial results of 52 East of Scotland farms for 1946/47 comprising Group 1. 28 hill sheep farms and Group II. 24 stock rearing farms.** By *W. B. Duthie*. 1948. pp. 20. [Mimeographed] **1230**

The report deals with 52 farms in Scotland. In Group I the financial results of 28 hill sheep farms are considered. The area of land under grass and crops for home consumption declined from 4.5 per cent in 1944 to 3.5 per cent in 1946. Capital invested in crops averaged £184 per farm, 3 per cent of total capital, compared with 85.5 per cent invested in live stock. Sales of oats, barley and potatoes totaled £215 per farm. In common with other receipts this figure was lower than in the preceding year.

In Group II 24 stock rearing farms were studied. These farms relied on sales of cash crops for a much higher proportion of their income than those in Group I. Oats, barley, potatoes and fodder crops accounted for 11 per cent of the land area, pasture and hay took up 29 per cent. Investment in crops amounted to £313 per farm, or 6 per cent of total. Receipts from the first mentioned items amounted to 27 per cent of the output per hundred acres, 1 per cent higher than in 1945-46. Prices realised for crops were somewhat higher in the later year.—T.G.J.

ABERDEEN, NORTH OF SCOTLAND COLLEGE OF AGRICULTURE, Agricultural Economics Department. Financial Rep. No. 7. **Feeding cattle.** By *A. D. Imper*. 1948. pp. 5. [Mimeographed] **1231**

The report relates to 67 farms (average size 278.5 acres). Wheat and barley played a lesser, and oats a greater part in the cropping than in the previous year. Crop receipts (including subsidies) amounted to £947 0s. 0d., total receipts to £2680 18s. 0d. Oats contributed the largest income among crops, £449 0s. 0d. or over 36 per cent.—T.G.J.

ABERDEEN, NORTH OF SCOTLAND COLLEGE OF AGRICULTURE, Agricultural Economics Department. Financial Rep. No. 8. **Breeding, rearing and feeding farms.** By *A. D. Imper*. 1948. pp. 5. [Mimeographed] **1232**

Ninety-three farms with an average size of 280.5 acres comprise the group under consideration. Cropping for the year 1946 revealed a continued decline in cereal acreages, while the acreage under grass increased slightly. There has been some change in the distribution of live stock as a result. Increases in profits are attributed to higher receipts from crops; higher yields more than offsetting lower acreages. Income from this source (including subsidies) amounted to £644 2s. 0d. out of a total of £1597 5s. 0d.—T.G.J.

ABERDEEN, NORTH OF SCOTLAND COLLEGE OF AGRICULTURE, Agricultural Economics Department. Financial Rep. No. 9. **Dairy farms.** By *A. D. Imper*. 1948. pp. 5. [Mimeographed] **1233**

This report relates to the relative profitableness of 48 farms in the north-east of Scotland during the cropping year 1946-47. Acreages under grass continued to increase while cereal acreages decreased slightly. Crop expenses on the average farm were £264 10s. 0d. out of a total of £2510 9s. 0d. Receipts from crops (including subsidies) amounted to £735 16s. 0d. as compared with total receipts of £3039 5s. 0d. Crops accounted for 23.7 per cent of the average farm surplus, 5.9 per cent of the highest and 6.0 per cent of the lowest farm surpluses respectively.—T.G.J.

ROBERTS, B. H. **Hill sheep—a study of costs and returns on 48 Welsh farms during 1945-46.** 1948. pp. 19. [Mimeographed]. [Dep. Agric. Econ., Univ. Coll. of Wales, Aberystwyth]. **1234**

On this group of farms the predominant importance of sheep is illustrated by the fact that they utilize 88 per cent of the grazing. A few farms grew rape or rape and turnips to finish-off lambs for grading, but the amount of land devoted to this purpose averaged between 6 and 7 acres per farm. Most farmers had to rely on agistment (the taking of live stock of others to graze for a certain sum) to counteract the quantity or quality or both of their own land. Among factors influencing the profitability of this system of farming the author lists the provision of adequate grazing for wintering ewes and the provision made for green crops for fattening sheep. The care with which the problem of improving the productivity of hill land should be approached is emphasised. The structure of grazing costs for grass and other crops such as rape and/or turnips is discussed. For grass, rent accounts for approximately half of the prime costs, with manual labour of next importance. Manual labour, manures and contract work are the most important prime costs in the growing of other crops for grazing.—T.G.J.

CANADA, Department of Agriculture. Proc. Publ. **Dairy farm management in Nova Scotia.** By *C. H. Chisholm*. 1948. pp. 35. **1235**

The land is suitable for roots and vegetables but high labour costs preclude roots to some extent as cattle food. A strong case is presented for efficiency in the production of feed and cash crops. An index of yields of hay and grain shows that labour earnings are directly related to efficiency in land use. It is pointed out that size of unit and combinations of enterprises vitally affect the financial results of any farm or farming system. In a suggested programme for a hypothetical farm main emphasis as regards cropping is placed on hay and pasture with grain as a necessary part of the rotation. The growing of cash crops is mentioned, where labour is available.—T.G.J.

DISEASES AND PESTS

SOUTH AFRICA, Department of Agriculture. Entomol. Ser. No. 21. Sci. Bull. No. 276. **Miscellaneous D.D.T. studies, with special reference to some common agricultural pests.** By *B. K. Petty*. 1946. pp. 16. **1236**

A preliminary report on the efficiency of DDT against certain South African crop pests. DDT was highly toxic to cabbage butterfly (*Plutella maculipennis*), Eucalyptus mont beetle (*Gonipterus scutellatus*), tsetse fly (*Glossina pallidipes*), cochineal insects and the termite *Trinervitermes havilandi*, though the nests of the latter were difficult to exterminate. DDT controlled the bagrada bug (*Bagrada hilaris*) and the army worm (*Laphygma exempta*) up to the fourth instar, and was promising against wattle jaroids (*Bythoscopus cedananus*) and wattle capsids (*Lygididolon laevigatum*); it was disappointing against wattle bagworm (*Acanthopsyche junodi*). Laboratory tests with twelve DDT derivatives showed that none except $\alpha\alpha$ bis (p-methyl-phenyl)—$\beta\beta$ dichloroethane compared with DDT in toxicity.—K.J.S.

WEEDS

VIDME, T. Kampen mot ugraset. De nye midler som står til rådighet. [**The control of weeds. The new preparations which are available.**] *Norsk Landbr.* **14.** 207-11. 1948. **1237**

Results of trials with hormone preparations are reported.—R.P.J.

HOFSTEN, C. G. von. Bekämpningsförsök mot ogräs. [**Experiments to control weeds.**] *Förs. Forskn.* **5.** 33-4. 1948. **1238**

Experiments conducted by the Agricultural College of Sweden from 1941 to 1946 showed that in combating weeds in autumn cereals treatment in the autumn, 5 to 11 weeks after sowing, was more effective than in the spring: calcium cyanamide, 150 to 300 kg. per ha., proved better than sulphuric acid. At Ultuna nitrocreosol has been very effective against weeds in flax. With spraying in spring cereal crops good results were obtained when nights with heavy dew followed the treatment. A large part of the weeds which fall to the ground can be destroyed by stubble cultivation. Hormone derivatives are effective in combating the perennial thistle and the annual mustard. It has long been known that early sowing increases the frequency of annual weeds. A recent investigation at Ultuna has confirmed that this applies also to perennial weeds. Late spring cultivation injures weeds in a higher degree than early cultivation.—R.P.J.

CIFERRI, R. Saggio d'emerecologia sulle comunità agrestali delle regioni irrigue della Repubblica Dominicana (Antille) e del Benadir (Somalia Italiana). [**Essay of hemerecology on the agrestal communities of the irrigated regions of Santo Domingo Republic (Antilles) and of Benadir (Italian Somaliland).**] *Atti Ist. bot. Univ. Pavia* Ser. 5. **7.** 35-92. 1946. **1239**

This essay includes the observations gathered from 1926 to 1932 in the Republic of Santo Domingo and from 1934 to 1936 in Benadir (Italian Somaliland) on the sociology of weeds of the irrigated fields of arid regions. Lists of species encountered, showing frequency and distribution, are given. Comparison between the flora of the two regions shows that specimens in common are reduced to very few pantropical species. For comparison, a list of agrestal species of Giava is also reported.—E.B.

ORCHARD, H. E. **Weeds of South Australia, Salvation Jane** (*Echium plantagineum*, **L.**). *J. Dep. Agric. S. Aust.* **51.** 485-7. 1948. **1240**

Field control of the weed Salvation Jane (*Echium plantagineum*, L.) is achieved by heavy stocking with sheep when the plants are still young. This is the most economic method of keeping it in check. Hoe-cutting and hand-pulling must be resorted to in seed producing pastures.—G.M.H.

IBARRA, Florinda E., and LA PORTE, J. Las Crucíferas del género *Rapistrum* adventicias en la Argentina. [**Cruciferae of the genus** *Rapistrum* **adventicious in Argentina.**] *Rev. argent. Agron.* **15.** 81-9. [English summary, p. 88] 1948. [Min. Agric., Argentina] **1241**

Seeds of *Rapistrum microcarpum* and *R. rugosum* are adulterants frequently present in samples of cereal, flax, lucerne and Sudan grass seed received by the Seed Testing Division of the Argentine Ministry of Agriculture. A botanical description and notes on the cytology of these two species are presented. The fruits and seeds of *R. microcarpum* are smaller than those of *R. rugosum*. *R. microcarpum* is rare, but *R. rugosum* is commonly found in cultures. Since eradication is easy, neither species is of much importance as a weed, but as seed adulterants they are important because it is practically impossible to separate *Rapanistrum* seed from seed for sowing. The control advocated is the careful examination of all seed for these adulterants before sowing.—G.M.R.

CEREALS

McKeon, B. F. **Cereal investigations in the Wimmera.** *J. Dep. Agric. Vict.* **46.** 129-40. 1948. [Longerenong Agric. Coll.] **1242**

This is an account of experimental work conducted at the Longerenong Agricultural College. In 15 years of fallow cultivation tests there has been no uniform superiority in yield from either summer or winter fallow as each type has shown to advantage in different years. Over this period summer fallow has given an average yield of 36.0 bu. per acre, and winter fallow 35.3 bu. per acre. The tests emphasize the importance of early flowering in the Wimmera and demonstrate the advantage gained by completing the fallowing in July-August. The advantage of adequate cultivation has also been demonstrated and results show that the use of sheep alone is not sufficient preparation for Wimmera land. Studies have also emphasized the importance of soil moisture conservation by fallowing, and of weed control during the fallow period; weed growth has a very significant effect in depleting both soil moisture and available nitrogen in the fallow.

From the table giving details of the wheat manurial trials which has been in progress for 35 years it is seen that best results have been obtained from the use of superphosphate alone. The use of lime or nitrogenous fertilizers with wheat on fallow under Longerenong conditions is not necessary.

Tests on many farms in the Wimmera particularly on the black soils in the western section of the district, demonstrate that " the use of zinc sulphate is an economic means of increasing, to a certain extent, the wheat yields on fallowed land not previously treated with the mineral."

In the experiments comparing the hay yields of a number of oat and wheat varieties, average yields in the wheaten hay section have been heavier than those obtained from the oat varieties. Of the oats, the varieties Algeribee, Dawn and Algerian have been the most prominent of the mid-season types, while the early maturing oats Mulga and Orient have also returned good yields.—G.M.H.

Watson, H. C. H. **Cereal tests in the northern districts.** *J. Dep. Agric. Vict.* **46.** 97-104. 1948. [Dookie Agric. Coll., Victoria, Australia] **1243**

This is an account of cereal experimental work conducted at Dookie Agricultural College and other Northern District centres. The experimental work conducted at Dookie College since 1933 has included the following investigations (1) Variety Trials—wheat, oats, barley, etc.—on fallow and on stubble land; (2) Cereal breeding and seed production; (3) Manurial trials—wheat and oats; (4) Rate and time of seeding trials with wheat; (5) Grazing trials with wheat and oats; (6) Disease investigations with wheat and oats; (7) Cultivation trials with wheat; (8) Crop growth investigations and (9) Crop rotation tests and soil fertility trials. Notes are given on the design of cereal experiments, cereal breeding, wheat variety tests and on the prominent Quadrat, Magnet, Pindar, Diadem, Gluska, Baldmin, Pinnacle, Bencubbin, Rance 4H, Insignia and Regatra wheats in the various tests.—G.M.H.

Washington, Caribbean Research Council. Crop Inquiry Ser. No. 3. **Grain crops in the Caribbean.** 1947. pp. 136. **1244**

See also *Herb. Abstr.* 17, Abs. 22 and 23 for Nos. 1 and 2 of this series. The agricultural systems in the Caribbean are mostly based on monocultures for the export market. Factors which have assumed outstanding importance, following the war-time development of grain crop production, are the possibilities of increasing home-grown food and of fostering inter-Caribbean trade. Production is dealt with separately for the different territories. With the exception of rice in the Guianas and corn in British Honduras and Jamaica, acreage and yields of grain crops in normal years are small. Methods of cultivation are inefficient and there is need for improved storage facilities, mechanization, pest control, and development of research generally. It is considered that without expanding the acreage under grain crops and without affecting the present allocation of arable land to export crops, increase in grain crop production is quite practicable.—M.H.

Chao, L. F. **Problems of rice production in China.** *Mon. Fmrs Bank China* **8.** 2-3. 1947. **1245**

Despite an annual pre-war output of about one million piculs of husked rice from over 270 million mows of rice fields (i.e. 37 per cent of total world production) China was forced to import on an average some16 million piculs annually to meet the needs of her population. By 1946 the annual shortage was estimated at 58 million piculs. Methods suggested for increasing production include the improvement of the irrigation system, and adequate supply of fertilizers, improvement of the variety of rice and the methods of cultivation. The employment of thrashing machines and grass mowers, the cultivation of varieties which are immune from insect diseases and the application of insecticides are considered of equal importance.—G.M.H.

CIFERRI, R. I risi perennanti (*Oryza perennis* e *O. latifolia*) della Republica Dominicana. [**Perennial rices** (*Oryza perennis* **and** *O. latifolia*) **of the Republic of Santo Domingo.**] *Atti Ist. bot. Univ. Pavia* Ser. 5. **7.** 7-17. 1946. **1246**

The systematic position and habitat of *O. perennis* and *O. latifolia* are given. The geographical distribution in central and South America of the two species (which are amongst the very few species of *Oryza* native to America) is also indicated. These species are morphologically well separated from cultivated rice which was imported into America in post-Columbian time.—E.B.

CHIANG, S. Y. **The production of cereals in China.** *Mon. Fmrs Bank China* **8.** 6-7. 1947. **1247**

Notes are given on the Chinese production of millet, sorghum, maize and soybeans. Maize cultivation takes place in North China and in the north-east ranks next to wheat as the principal foodstuff. It supplies 17 per cent of the total rural food consumption. Sorghum is grown mainly in Shantung, Shansi and Honan and maize in Sungkiang, Chilin, Hopei and Shantung. Soybeans which supply human and animal food and material for industry are grown in the north-eastern plains. In 1946 the soybean acreage was 60,507,000 mows and the output was 90,692 piculs.—G.M.H.

CROCIONI, A. La cimatura e la sfogliatura del granoturco in relazione alla siccità. [**Topping and stripping of maize in relation to drought.**] *Ital. agric.* **84.** 235-41. 1947. **1248**

The effects of topping and stripping of maize, mainly in relation to drought, have been studied on an experimental farm in the Bologna plain. The grain and forage productions obtained with different grades of topping and stripping in different conditions of humidity are tabulated. Although experimental conditions were not ideal, some interesting conclusions have been reached, mainly that the negative effect on grain yield of topping and stripping is reduced with the increase in drought.—E.B.

COOK, J. **Fallow season cultivation of irrigated padi land in Malacca.** *Malay. agric. J.* **31.** 115-8. 1948. [Agric. Officer, Malacca] **1249**

It is in the Central and Mor Gajah Districts that fallow season cultivation is most actively pursued. Holdings vary in size from 5 to 12 acres but generally one or two acres are favoured, the latter being capable of providing a living for a typical average sized Chinese family of two to three adults with four or five children. Scheduled planting dates for the main padi crop are strictly adhered to but instead of planting a long or medium strain, a short one such as Radin Siak or Padi Wangi, the latter an introduction from the Netherlands East Indies, is favoured. Normally such practice invites trouble at harvest from pest with a grave risk of loss of the entire crop but th industrious Chinese successfully surmount th obstacle. Adults and children spend all the spare time in pest control during this fortunatel short, but vulnerable stage when the padi is in fu ear. Harvest commences at the end of Decembe a period when favourable weather may be expecte

Careful preparation of the irrigated padi lan follows harvest during which the stubble and wee are removed, burnt and the remaining lan ploughed to a depth of 6 in., and subsequentl made up by hand labour into a bed, measurin roughly 4 feet at the base and 2.5 feet on the to With two exceptions the crops most favoured the cultivators are short-termed and compri beans, cucumbers, tomatoes, chillies, celery, lettu mustard and sweet potatoes.—G.M.H.

KEE, V. T. **Cultivation of Taiwan padi in Pera during the Japanese occupation.** *Malay. agri J.* **31.** 119-22. 1948. [Central Exp. St Segemat] **125**

As an attempt to solve the problem of a seve food shortage the Japanese during their occupa tion, introduced Taiwan padi into Perak. Exper mental plantings were made in 1943 on 4000 acr at Sungei Manik but success was obtained only o those areas where the prescribed methods of plan ing, which involved an abrupt change of tec niques, were accurately followed. The seco planting in the Krian District was a failure becau of the great depth of the alluvial soil and th difficulties of drainage. The idea of forcing th kampong people to plant Taiwan padi was ther fore abandoned and permission was given to pla their own strains from 1944 onwards.

The cultivation of Taiwan padi conforms the technique of padi cultivation employed China, Japan and Formosa. In these countri it is not the practice to leave *sawah* land fallo as in Malaya and thus the necessity of first havi to *tajak* the rank growth of grasses is eliminate

The following varieties of Taiwan padi we introduced and planted in the Krian and Low Perak Districts: 1. Zairaishu (Pure Strains) Ryushu, (b) Peipihun, (c) Gosisai, (d) Tai-Riuba 2. Horaishu (Hybrid) (a) Kanan 2, (b) Taichu (c) Taichu 176.—G.M.H.

TAIWAN, Agricultural Research Institute. Bull. **The effect of continuous application of the sa fertilizer on the yield of rice and the physical a chemical properties of soil.** By *S. C. Chan J. F. Lin* and *Y. S. Puh*. 1947. 18-43. [Agr Res. Inst., Taiwan] **12**

The results of field manurial experiments w the Formosan native variety and Japanese varie of rice are presented. The experiments, wh covered a period of 24 years, involved the application of 12 different fertilizer treatments. Fairly good yields were obtained in the first few years as a result of continuous applications of ammonium sulphate but there was an appreciable decrease in the yields in subsequent years. Superphosphate by itself was effective in the yield of seed but not in the yield of straw. Yields were not effected by applications of potash.

Whilst maintaining a good level of soil fertility during the 24 years' experiments, stable manure did not prove so effective in the early rice crop as in the late one. Soybean cake gave fairly good yields during the whole period. Green manure proved effective during the first few years, but as with ammonium sulphate there was a decrease in yields in the years that followed. The complete inorganic fertilizer proved generally inferior to the organic manure, but with the addition of lime the yield, especially that of seed, showed a pronounced increase.—G.M.H.

TAIWAN, Agricultural Research Institute. Bull. 3. **A discussion on the results of thirty years' experiment of growing rice without applying fertilizer.** By *C. T. Chen,* and *J. F. Lin.* 1947. pp. 17. [Agric. Res. Inst., Taiwan] **1252**

The results of a continuous experiment from 1911 to 1934 of growing rice without applying fertilizer for the purpose of ascertaining the general tendency of decreasing yields and deterioration of soil fertility are presented.—G.M.H.

WATSON, H. C. H. **Cereal tests in the northern districts.** *J. Dep. Agric. Vict.* **46.** 223-34. 1948. **1253**

An account is given of cereal experimental work conducted at Dookie Agricultural College and other Northern District centres. Hay experiments with wheat and oats have been carried out on fallow and stubble land since 1934-35. In the tests on fallow, Turvey and Warden were the most prolific of the hay varieties tested over the full period. Warden, on account of its red grain, is suitable as a hay wheat only, and not as a dual purpose variety. Of the newer varieties, Bencubbin was the most promising dual-purpose wheat when the tests were discontinued in 1941. The oat varieties Algeribee and Dawn were also tested on fallow land, both giving higher average hay yields than the wheat varieties over a three-year period.

An experiment to furnish information as to the best varieties of oats for providing feed for sheep during the winter and spring months gave Algeribee, the later-maturing variety, as supplying the heaviest bulk in the " completely fed off" section (54.7 cwt. per acre). In the "grazed once" section it again produced most green feed (10.9 cwt.) and recovered best to register the highest hay yield (23.1 cwt.).

In an experiment to determine the effect on yield of grazing the wheat crop with sheep in late winter and to compare the behaviour of different varieties under grazed and ungrazed conditions, grain yield was reduced in each case, the decrease on the average being greatest with Ghurka (40 bu. per acre) and least with Baldmin (2.1 bu. per acre).

Results from rate and time of seeding trials with wheat confirm the general experience on the red loamy soils in the Dookie district, that provided the fallow is in good order and the land reasonably free from weeds, the sowing of the wheat crop in May returns higher average yields than later sowing. There was little difference in the yield from the three treatments, 50, 75, and 100 lb. of seed per acre, in the section sown in May.

Variety trials with barley showed that of the 6 row types, Cape returned the highest average yield while the new malting variety Research has given encouraging results. The malting types, Research and Prior produce grain of higher malting quality and therefore higher value than do the feed types such as Cape.—G.M.H.

PIRES, D. R. V. Aspectos portugueses do melhoramento de plantas. [**Aspects of plant breeding in Portugal.**] *Rev. agron. Lisboa* **33.** pp. 8. 1945. [Received 1948.] [Director, Plant Breeding Station, Elvas, Portugal] **1254**

In an address to the First National Congress on Agrarian Sciences, work done by the National Plant Breeding Station at Elvas since its foundation in 1937 is briefly outlined. Several improved varieties of herbage and forage plants and also of cereals have been produced, but the urgent need now is for the establishment of centres in all parts of the country where these new varieties can be adapted to the very different environmental conditions of the various regions. The centre can be an already established agricultural service, but the personnel should be undistracted by other duties. Stapledon is quoted (" . . . selection and plant breeding must be conducted within the regions " Rpt. 4th Int. Grassl. Congr. 1937. p. 1.) and the example of Sweden's Svalöf Institute with its eight regional substations is noted. In addition, the necessity for seed reproduction centres, supervised by the Plant Breeding Station, is stressed.—G.M.R.

DAALEN, C. K. van. Het veredelen van maïs. [**Maize breeding.**] *Maandbl. LandbVoorlDnst* **5.** 376-8. 1948. [Inspector of Agric. Research, Netherlands] **1255**

A short review of the growing and breeding of maize in the United States includes notes on some special varieties, such as one with tapioca-like qualities intended to replace the tapioca unobtainable from the Netherlands Indies during the war, and notes on the chemical properties of maize.—G.M.R.

SILVA, M. D. da. Plano para a produção e distribuição de sementes "melhoradas" de milho. [**Plan for the production and distribution of bred seed of maize.**] *Rev. agron. Lisboa* **33.** pp. 11. 1945. [Received 1948.] [Plant Breeding Station, Elvas, Portugal] **1256**

The plan outlined envisages the breeding by the Plant Breeding Station at Elvas of maize varieties adapted to the different regions and the production and distribution of the improved seed by regional organizations under the supervision of the Station.—G.M.R.

EDWARDS, D. C. **Kavirondo perennial sorghum an improved type, R2S42.** *E. Afr. agric. J.* **13.** 202. 1948. [Pasture Research, Kenya] **1257**

This is a brief progress report on the breeding and selection for improvement of material derived from a plant found in 1935 near Maseno in the Kavirondo area of Kenya. The plant appeared to have resulted from natural crossing between a cultivated grain sorghum and *Sorghum verticilliflorum* Stapf, a widely distributed indigenous plant. The unimproved material, in which several clearly different types appear simultaneously, has gained a certain degree of popularity for silage production and aftermath grazing in the drier agricultural regions of both Kenya and Tanganyika over the past six years.

Four distinct varieties of the sorghum have been obtained by open selection and have been called "Black," "Red," "White," and "Mtama-like" types. In addition attempts have been made to self selected plants from each type. As a result of this latter work, a line which appears to be distinctly superior to the original material has emerged. This is known as "R2S42" which indicates that it is derived from the second red plant self-pollinated in 1942. The chief points in which R2S42 surpasses the original material are that "it is distinctly more robust and leafy and gives a heavier crop in which the plants attain 9 or 10 feet in height. The inflorescence combines the semi-naked fruits characteristic of the "Mtama-like" type with the open panicle of the other three types. The appearance of the fruits suggest that the crop might serve the dual purpose of both fodder and grain production."

It is proposed to replace the limited commercial seed supply of the original Kavirondo Perennial Sorghum by the superior R2S42 using the name "Improved Kavirondo Sorghum" to distinguish the new type.—G.M.H.

PIRES, D. R. V., and PEREIRA, A. M. Àcerca do valor de duas formas novas de trigo. [**The value of two new wheat varieties.**] *Rev. agro*
Lisboa **33.** 1-6. 1945. [Received 1948
[Director, Plant Breeding Station, Elva
(D.R.V.P.), and Chief Agronomist 8th Regio
Castelo Branco, Portugal (A.M.P.)] **125**

Two new wheat varieties produced at t
Elvas Plant Breeding Station from the hybridiz
tion of Montana 9911 and Môcho de Espi
Branca 2023 are characterized by a reddis
glabrous spike having divergent awns, dark grai
and fine straw a little shorter than that of Ardi
but less inclined to lodge. An account is given
the behaviour of these varieties, Nos. 15 and 1
in comparison with the varieties Quaderna a
Ardito, in good, fertile soil at Elvas, and of No.
in poor, light soil at Castelo Branco, where as
rule it is only possible to grow wheat after gre
manuring. No. 15 has proved to be particular
hardy, and while it can hardly compete with t
varieties Quaderna and Ardito in general pr
ductivity, it is suitable for poor, light lands of t
type in which, in Italy, Quaderna performance
so outstanding, and it has the advantage of som
what better quality than has Quaderna.—G.M.R.

CALDEIRA, J. J. P. A produção de algumas mi
turas de trigo de primavera.] **The productivi**
of some spring wheat mixtures.] *Rev. agro*
Lisboa **33.** pp. 3. 1945. [Received 1948
[Plant Breeding Station, Elvas, Portugal] **125**

It was noted in the inspection of region
wheat cultures for seed, that a spring whe
variety named Ribeiro was never found in pu
cultures but mixed to about 50 per cent with t
variety White Tremês. The Elvas Station gre
5 experimental sowings, with 5 replicates,
each variety alone and of the 2 varieties in var
ing proportions. The best result was obtain
from the pure sowing of Ribeiro, and the next be
from the mixture in which this variety predomi
ated, so that it is justifiable to advise farmers
use the Ribeiro variety in pure sowings. T
seed weight per hectolitre for each of the expe
mental sowings was also determined.—G.M.R.

FOOD AND AGRICULTURE ORGANIZATION OF T
UNITED NATIONS. Agric. Studies No. 2. **Prese**
vation of grains in storage. By *S. S. Easte*
1948. pp. 178. [F.A.O. Plant Industry Branc
12

This volume contains seventeen papers on t
preservation of grains in storage which we
presented at the International Meeting on Infest
tion of Foodstuffs held in London on 5-12 Augu
1947. The papers deal specifically with infest
tion control in stored food or food in transit ; th
do not cover insect control in the wide field
crop production.—G.M.H.

TAIWAN Agricultural Research Institute. Tech. Bull. No. 5. **Regional and varietal difference of discoloration of the husked rice extract treated with methylene blue.** By *W. T. Tang* and *C. H. Hwang*. 1947. pp. 19. **1261**

Discolouring of the Horai varieties and the varieties from Japan was more prominent than that of the local Taiwan varieties, China Proper and tropical Asia. The cultivated varieties of rice may be classified into two main groups, the discoloured (varieties from the cold northern regions) and the non-discoloured group (warm southern regions). Upland rice and glutinous varieties are more liable to be discoloured than the lowland or non-glutinous.—From English summary.

KRAMER, H. H., and ALBRECHT, H. R. **The adaptation to small samples of the pearling test for kernel hardness in wheat.** *J. Amer. Soc. Agron.* **40.** 422-31. 1948. [Dept. of Agron. Penn. Sta. Coll. Pa.] **1262**

Data show that it is possible to perform the pearling test on the small samples available in early segregating generations. Reliable results were obtained on samples of 2.5 gm. or less than 100 kernels.—K.J.S.

D'ANDRÉ, E. La calidad industrial de veintiséis variedades de trigo cosechadas en la República Argentina en el año garícola 1945/1946. [**The industrial quality of twenty-six varieties of wheat harvested in the Argentine Republic in the agricultural year 1945-1946.**] *Granos* **11.** 21-70. 1947. [Min. Agric., Argentina] **1263**

An account is given of an official trial for industrial quality of 26 varieties, of which 15 were hard wheats, 11 semi-hard. Six are as yet only conditionally accepted varieties, although some of them are already at an advanced stage of experimentation. Sowings took place between the 20th April and the end of July, 1945, harvests between November, 1945, and January, 1946. The data presented in 23 tables are taken from the analysis of samples obtained from 41 different stations, 35 located in the Argentine wheat belt proper, 6 in distant, marginal zones.

The industrial value of the wheats grown in the wheat belt was affected by abnormal conditions and especially by a persistent drought in the 1945-46 growing season, which resulted in poor values for yield of meal, counterbalanced by good values for gluten and strength.

Of the wheats from the marginal zones, those from the province of Tucumán were most distinguished, on account of their high gluten content and good bread volume.—G.M.R.

MANCHESTER University, Agricultural Economics Department. Bull. No. 43/EC 19. **Costs of growing wheat in the North West province, 1947 crop.** 1948. pp. 5. **1264**

Costs were obtained for thirty-four crops of wheat in Lancashire and Cheshire during 1947. The average cost of the 274 acres was £15 14s. 1d. The average cost per ton was £16 10s. 0d. The crops which with one exception were winter varieties, suffered from a severe winter and a subsequently dry summer, with the result that the average yield of 18.6 cwt. per acre was lower than usual. The area from which the results were obtained was divided into three parts, for purposes of comparison. Farms in Cheshire had the lowest costs per ton and per acre and showed the poorest yields. Farms in south-west Lancashire had the highest costs and produced the highest yields. The yields and results obtained in north-west Lancashire fell between those of the other two areas.—T.G.J.

GUATEMALA, Ministerio de Agricultura, Departamento de Economia Rural. Analisis de la economia del trigo en la República de Guatemala. [**The economics of wheat growing in the Republic of Guatemala: an analysis.**] By *F. de J. Osegueda*. 1947. pp. 40. **1265**

Wheat growing in Guatemala is centred in six adjacent Departments, where it constitutes the chief agricultural industry. Production at present covers 50 per cent of the country's requirements, but it could cover the whole and also export to other Latin American countries if the following problems were solved: (1) the use of land exhausted from continuous wheat-growing with no manuring and no rotation of crops; (2) the use of degenerate or inappropriate seed; (3) the use of primitive implements; (4) lack of credit. The natural conditions for wheat growing are excellent, and State-aided mechanization is considered to be one means of solving the problems enumerated. The theme is discussed from the financial aspect, milling being also taken into consideration.—G.M.R.

LAFFERTY, H. A. **Seed testing developments in Ireland.** *Proc. int. Seed Test. Assoc.* **14.** 14-8. 1948. [Seed Testing Station, Dublin] **1266**

The area of corn crops grown in the twenty-six counties of Ireland increased from 760,306 acres in 1932 to 1,645,915 acres in 1942. To enable the Department of Agriculture to keep a check on the quality of cereal seed distributed by merchants and seed assemblers, a scheme for testing cereal seeds was put into operation in 1942. Prior to the introduction of the scheme, for tests of germination capacity farmers had to apply to the Official Seed Testing Station, but now they can obtain the information required from nearly 100 centres throughout the country or, alternatively, by simple tests, carried out in their own homes.—M.H.

GOODSELL, S. F. **Triphenyltetrazolium chloride for viability determination of frozen seed corn.** *J. Amer. Soc. Agron.* **40.** 432-42. 1948. **1267**

A quick test is necessary for viability of seed after severe frost-injury to the seed parent. 2,3,5-triphenyltetrazolium chloride solutions were used on hybrid seed corn which had been frozen while high in moisture content. The evidence presented shows that seed corn below 49 per cent moisture in the grain when frozen may be satisfactorily tested with tetrazolium for minimum damage at least within 48 hours after the end of a freezing test. Subsequent deterioration requires investigation of standard germination tests before planting.—K.J.S.

LEUKEL, R. W. **Recent developments in seed treatment.** *Bot. Rev.* **14.** 235-69. 1948. [Div. of Cereal Crops and Diseases. Bur. Pl. Ind. Soils and Agric. Engng, U.S.D.A.] **1268**

Literature since 1936 is reviewed. Developments are in the treatment of hybrid corn which has increased in U.S.A. from 3.1 per cent to 67.5 per cent of the total maize acreage ; official testing of seed dressing agents which has led to improved standards of materials and recommendations for individual crops ; the design and manufacture of improved seed dressing equipment. The newer fungicides and their applications are described and their effects on seeds in storage. Evidence regarding the inclusion of hormone seed treatments is reviewed.—K.J.S.

UNITED STATES Department of Agriculture. Tech. Bull. No. 953. **Dormancy and the effect of storage on oats, barley and sorghum.** By *E. Brown, T. R. Stanton, G. A. Wiebe* and *J. H. Martin.* 1948. pp. 30. **1269**

A study of dormancy in cereals required for spring sowing immediately after harvesting in the southern states. Dormancy is expressed by failure of seeds to germinate equally well over a range of temperatures. Results of about 40,000 tests on oats, barley and sorghum show the effect of storage conditions on after-ripening germination response to temperatures, and varietal differences in dormancy. Most cereals after-ripen completely when stored 1—6 months at 104°F. The most dormant oat was Vavilov (*A. nudibrevis*) ; Red Rust-proof type strains were generally the more dormant, followed by strains of Fulghum and Fulgrain. In barley dormancy is a varietal character. Dormant varieties come from the Near East (distribution of *H. spontaneum*) and N. Africa. The least dormant come from Abyssinia. Dormancy is less common in sorghum than in barley and oats.—K.J.S.

ANDERSON, J. C., and WOLF, D. E. **Pre-emergenc control of weeds in corn with 2,4-D.** *J. Ame Soc. Agron.* **40.** 453-8. 1948. **127**

Pre-emergence dressings of 1.5, 2.5 and 3. lb. of 2,4-D per acre were applied to four maiz hybrids at 0 and 8 days after planting. Th 1.5 lb. treatment 8 days after planting gave considerably the highest yield for each hybrid although the differences were not all significan Susceptibility of maize seedlings to 2,4-D decrease rapidly up to the 8th day after planting. [Se *Fld Crop Abstr.* 1, *Abs.* 178.]—K.J.S.

FRANÇOIS, L. Semences et jeunes plantes chez l dipsacées et les composées. [**Seeds and seedling of the Dipsaceae and the Compositae.**] *An agron. Paris.* **17.** 674-713. 1947. **127**

The plants described and illustrated are important as weeds occurring amongst forage crop and cereals. Of the Dipsaceae seeds and fruit numerous species of *Scabiosa, Cephalaria, Dipsacu* and *Knautia* are described. Of the Compositae th genus *Centaurea* has been studied most intensivel Other genera include *Onopordum, Silybum, Cirsiu Carduus* and *Hieracium.* Seedlings are describe of *Chrysanthemum coronarium, Leucanthemum vu gare, Matricaria inodora, Anthemis arvensis, cotula, A. austriaca, Geropogon glaber, Centaure cyanus, C. jacea, C. solstitialis, Cirsium arvens Helminthia echioides* and *Picris hieracioides.* [Se also *Herb. Abstr.* 16, *Abs.* 968.]—D.B.

FAVRET, E. A. Hallazgo de una nueva raza d "*Erysiphe graminis hordei.*" [**A new strain** *Erysiphe graminis hordei* **found.**] *Rev. Inves agric.* **1.** 237-40. (Min. Agric. Inst. Fitote Pub. Tec. No. 5) 1947. **127**

See *Review of Applied Mycology.*

Of over 200 varieties of barley tested, th Monte Cristo and Engledow India varieties *Hordeum spontaneum* were immune to the ne strain and some other varieties were more or le resistant, while a moderate degree of resistance w exhibited by some varieties of *H. distichu nigrinudum.* The behaviour of some hybrids w also studied.—G.M.R.

RALEIGH, S. M., and PATTERSON, R. E. **Roden injury on 2,4-D pre-emergence-treated co** *J. Amer. Soc. Agron.* **40.** 472-3. 1948. **12**

In pre-emergence treatments with standa weed killers, significantly lower stands were fou on 2,4-D-treated plots due to rodent injury. It concluded that the acid or the iso-propyl-est spray attracted field mice either by odour or tas or because of possible changes in the physiologic condition of the plant.—K.J.S.

LANSADE, M. Sur l'efficacité de quelques produits contre la carie. [**The effectiveness of certain products in controlling bunt.**] *C. R. Acad. Agric. France* **34.** 162-6. 1947. [Stat. Centrale de Pathologie végétale, Versailles] **1274**

Control of *Tilletia tritici* on wheat by the following agents is discussed: copper salts, hexachlorobenzene and mercury derivatives of ethane.—D.B.

CIFERRI, R. Recenti progressi italiani nel campo degli anticirittogamici. [**Recent Italian progress in anticryptogamics.**] *Atti. Ist. bot. Univ. Pavia* Ser. 5. **8.** 1-40. 1946. **1275**

Owing to lack of copper during the war years in Italy, the use of mercuric-organic products has prevailed in the fight against bunt of wheat (*Tilletia*). In 1944 mercury supplies having also become short, treatment was partly abandoned. As a consequence bunt, which had almost completely disappeared in wheat crops, is now the most serious amongst the fungous diseases.—E.B.

VANTERPOOL, T. C. *Ditylenchus radicicola* (**Greeff) Filpjev, a root-gall nematode new to Canada, found on wheat and other gramineae.** *Sci. Agric.* **28.** 200-5. 1948. [Dept. of Biol. Univ. of Saskatchewan Sask.] **1276**

This nematode is apparently kept in check or eradicated by the normal crop practices on the prairies. Important factors in control are the high resistance of oats, the immunity of dicotyledonous roots and the practice of summer-fallowing.—K.J.S.

VALLEGA, J., and FAVRET, E. A. Razas fisiológicas de "*Puccinia graminis tritici*" que atacan a "*Triticum timopheevi.*" [**Physiological strains of** ***Puccinia graminis tritici*** **which attack** *Triticum timopheevi.*] *Rev. Invest. agric.* **1.** 113-8. 1947. **1277**

Triticum timopheevi, a Transcaucasian wheat hitherto regarded as singularly resistant to fungous disease, has proved in Argentina susceptible to attack by *Puccinia graminis tritici.*

See *Review of Applied Mycology.*—G.M.R.

HAYNES, J. L. **The effect of availability of soil moisture upon vegetative growth and water use in corn.** *J. Amer. Soc. Agron.* **40.** 385-95. 1948. **1278**

An experiment to determine whether plants growing with unlimited water supply "waste" it. Data on maize grown under difficient irrigation levels indicate that under conditions of high soil fertility and good aeration, rates of vegetative growth increase markedly with increased soil moisture over the range permanent wilting percentage to near saturation of the soil. Inadequate soil aeration may limit drilled crops if soils remain in a state of wetness corresponding to the higher water applications. In contrast, permanent meadow crops increase in growth during wet periods in the growing season.

Water loss per unit of plant dry matter is independent of the degree of availability of water within the experimental range stated. During temporary wilting plants lose less water per unit dry weight than do non-wilting plants.—K.J.S.

KERLING, L. C. P. Ontwikkeling en periodiciteit bij rijst. **Development and periodicity of rice** (*Oryza sativa* **L.**). *Landbouwk. Tijdschr.* **60.** 150-8. [English summary, pp. 156-8] 1948. [Buitenzorg, Netherlands Indies] **1279**

Observations have been made of the following phenomena concerning periodicity in the development of the rice plant: (1) the synchronous flowering of the main stem and the oldest laterals; (2) the inhibition of bud development at a certain age; (3) the effect of the date of seeding on the length of the growing period. Development was studied in (a) two series of Oentoeng, an unawned variety the growth period of which is dependent on the date of sowing. One series was sown in January, the other in July. (b) One series of Baok, an unawned variety with a growth period of 130 days independent of the date of sowing. (a) and (b) were grown in nutrient solution. (c) Plants of the same varieties and the same date of sowing from the rice fields. Plants were dissected at any age of the developmental cycle.

The author's findings are recorded at some length in the English summary. The following are some points. The vegetative point of the embryo is surrounded by a coleoptile, two young leaves closely packed together and a third leaf primordium. Development after germination is described. A younger leaf only elongates when the preceding one has reached maturity and a new primordium has been formed. The main stem has no internodes below the four oldest leaves. The factors governing the elongation of the internodes are described, and a connection is dermined between elongation of the leaves, the underlying internodes and flowering. The vegetative points of the main stem and of the sufficiently developed lateral shoots change into ear primordia one after the other within a few days; the panicles are developed in about 30 days and simultaneous elongation of the peduncles synchronizes flowering. The stage of development at which ripeness to flower may be reached in Oentoeng is described. At a certain age, depending on the variety, an inhibition of the process of tillering inhibits at the same time bud development, and the plant enters a second vegetative stage. The period in which stem elongation and bud inhibition take place, as well as the date of ear initiation, are dependent on the environmental conditions. An interrelation between these processes has not yet been determined. The unawned rice varieties endemic in northern regions are specially sensitive to day-length: examples are given. Both the series of Oentoeng studied reached maturity after 125 days: the difference in the developmental processes resulting from the different dates of sowing are described. Points requiring further elucidation are enumerated and the value of such studies for breeding work is noted.—From Author's summary.

Franzke, C. J. **Diurnal variations of hydrocyanic acid, dry matter, and total sugar in sorghum strains.** *J. Amer. Soc. Agron.* **40.** 396-406. 1948. **1280**

Data are presented graphically for 5 Dakota Amber strains. HCN content is evidently associated with photosynthesis, being greatest during the day time. Diurnal variation in HCN concentration is positively correlated with diurnal variation in total sugars in the leaves. Diurnal variation of HCN in sorghum is a function of genetic constitution of strains, growth and development stage of the plant and photosynthetic activity.—K.J.S.

Sande Bakhuyzen, H. L. van de. Bloei en Bloeihormonen in het Bijzonder bij tarwe. 1. [**Flowering and flowering hormones especially in wheat. 1.**] *Versl. landbouwk. Onderzoek* No. 53.4.B. 146-211. [English summary, pp. 200-5.] 1947. **1281**

Field and pot experiments were conducted during the years 1939-44 on the problem of shooting and flowering of ten varieties of wheat with varying cold requirements. The paper falls into two main parts, dealing respectively with a theoretical interpretation and the experimental results. Only the interpretation can be dealt with here.

The author suggests a diagram of progressive development which not only explains his own results and those of other workers on wheat, but which is also valid for other long and short-day plants. Similarities with and differences from the hypotheses of Lysenko, and Purvis and Gregory are discussed. Progressive development up to the moment of initiation of spikelet (inflorescence) primordia is considered as a chain reaction with three links (physiological phases of growth). Each link is characterized by the production of a specific substance: (1) thermo-phase (cold) by an enzyme-like vernalization-substance called "vernalase"; (2) interphase (high temperature eventually followed by short day) by "vernalin," and (3) photophase (high temperature and optimal day-length) by the ear (flower)-forming substance.

The existence of specific hormones for the initiation and further organization of each organ is postulated, and F. W. Went's nomenclature for these substances is accepted, namely, leaf (phyllo)-, root (rhizo)-, stem (caulo)-, ear or flower (antho)-forming hormone (caline). It is assumed that the different calines are formed by reversible reactions from one mother-substance, the protocaline. The elongation of the organs takes place through the action of auxin. [From part of Author's English summary; the whole summary is available on request.]—R.O.W.

ВЪЗВЪЗОВ, И. Исследование к приложению центрофугальнаго метода при определении вискозитета клеточной плазмы некоторых злаковых растений (пшеныци, ячмень) в связи с установление их сухоустойчевости. *Сельс. Наука. 1. Земледелие* Том 1, *No.* 2, стр. 1-22. София, 1946.

V'zv'zov, I. [**The centrifuge method for determining viscosity of protoplasm in some cereals (wheat, barley) in relation to drought resistance.**] *Seljs. Nauka* 1. *Zemledelie* **1.** 1-22. [In Bulgarian with Russian and French summaries, pp. 19-22] 1946. [Cent. Agric. Res. Inst. Sofia] **1282**

It is concluded that the method is applicable for determining viscosity, if the leaves are placed so as to maintain their natural position during centrifuging. Parenchyma cells are unsuitable for this purpose, and the following conditions are necessary: leaves should all be of the same age and have completed their physiological development; centrifuging should take place in the afternoon; and conditions should be as uniform as possible in the period before sampling. Resistance of different varieties is inversely correlated with viscosity of protoplasm in stomatal cells.—M.H.

McElroy, L. W., Kastelic, J., and McCalla, A. G. **1. Thiamine and riboflavin content of wheat, barley, and oats grown in different soil zones in Alberta. 2. The niacin content of wheat, barley and oats grown in different soil zones in Alberta.** *Canad. J. Res.* **26.** 191-200; 201-7. 1948. **1283**

Some 31 samples of Marquis wheat, 40 of Newal barley and 50 of Victory oats from 1944 and 1945 crops, grown on grey, black and brown soils were assayed for thiamine and riboflavin. The mean thiamine value was 4.4 ug. for wheat, 4.60 ug. for barley and 5.58 ug. for oats. The difference was significant between the value for oats and those for wheat and barley. Riboflavin values were 1.34 ug. for wheat, 1.25 ug. for barley and 1.27 ug. for oats (differences not significant). There was a highly significant correlation between protein and thiamine contents in wheat and oats but not in barley, but not between protein and riboflavin in any of the cereals. The thiamine content of all three cereals was significantly higher in samples grown in the brown soil zone than in the grey soil zone; the riboflavin content was slightly higher in crops from the black and brown zones than from the grey zone.

Niacin was determined by microbiological ssay on the same samples. Wheat contained 3.6 ug., barley 70.4 ug. and oats 10.3 ug. of niacin er grain. Chemical analysis indicated little lifference in niacin content of the three cereals. There was positive correlation between protein and iacin in wheat and oats. Niacin content showed easonal variation and was unaffected by soil ype.—K.J.S.

Clendenning, K. A. **Polarimetric determination of starch in cereal products. V. The particle size and extraction time requirements.** *Canad. J. Res.* **26.** 185-90. 1948. **1284**

In calcium chloride polarimetric procedures or starch in whole wheat and flour it was unnecessary to grind finer than 40 mesh. Agreement between the method and conventional chemical methods was within 0.3 per cent starch except for the coarser samples. For maximum starch recovery from 140 mesh samples the extraction time should be extended to 40 minutes. Analytical data are reported for ash, fat, protein, pentosan, polyuronide, crude fibre and starch contents of whole wheat and flour samples. Pentosans are found throughout the kernel; polyuronide fractions are located in the integuments.—K.J.S.

Coppenet, M., Ducet, G., Guérillot, J., and Kahane, E. Sur la silice de la paille et du grain de blé. [**Silica in the straw and grain of wheat.**] *Ann. agron.* Paris **17.** 565-7. 1947. [Inst. Recherche Agronomique (M. C. and G. D.) and École Nat. d'Agric., Grignon (J. G. and E. K.)] **1285**

The method of chemical analysis, using perchloric and nitric acids, is described. The silica content of straw from plots treated with nitrogen fertilizer was lower than from plots treated with non-nitrogenous fertilizers. This suggests that nitrogen tends to prevent assimilation of silica. The silica content follows the phosphorus and the ash content. The silica content of the grain was very small, too small to effect any comparisons.—D.B.

LEGUMES AND GRAIN LEGUMES

King, N. J. **Velvet beans for green manuring.** *Qd. agric. J.* **66.** 148-50. 1948. **1286**

A description is given of preliminary field trials with six varieties of velvet beans. The trials were carried out at Bundaberg Station with the object of selecting the most suitable variety for use as a green manure crop on sugar cane farms of the Bundaberg area. The six varieties were Black Mauritius, Q. 1660, White Mauritius Q. 1432, Marbilee Q. 1744, Jubilack Q. 1742, Smith Q. 708 and Somerset Q. 707.

Green harvesting weights and analyses of four of the varieties are given in tabular form; Jubilack and Smith were bad germinators and were not weighed because their stand was so sparse. The nitrogen content of these crops is particularly good and they are resistant to bean fly and wilt. Bean fly is always likely to destroy Poona pea crops, which is the principal green manure crop at the present time, in any part of the sugar belt if conditions are favourable; wilt causes severe losses in the wetter parts of the north. The drought resistance of velvet beans makes them a desirable type for all areas where soil moisture is likely to be a limiting factor in crop growth and the deep root system must have an ameliorating effect on subsoil conditions.—G.M.H.

Goosen, R. J. **Lupins for the improvement of orchard soils.** *Fmg S. Afr.* **23.** 160-4. 1948. **1287**

Lupins, while not fulfilling all the requirements, have proved capable of contributing much toward the solution of the fertilizer problem in the Langkloof area. If sown for the first time on a piece of land as in an orchard it is most essential that the seed be inoculated with the necessary bacteria; once a definite piece of land has been inoculated there is no need to repeat the process. The blue, white and pink lupins thrive excellently, but the yellow variety is in all respects poorer in this area.—G.M.H.

Shirlow, N. S. **Richmond Wonder French bean.** *Agric. Gaz. N. S. W.* **58.** 459. 1947. **1288**

This vew variety of French bean (*Phaseolus vulgaris*) has been evolved at Hawkesbury College and combines disease resistance with heavy yields of long, straight, fleshy pods. Richmond Wonder plants are vigorous, hardy and heavily productive over a long period; the stems are short and the pods are 9 to 10 in. in length. Although seed is not at present available for distribution, supplies will soon be made available. The value of the new variety for commercial growing lies in its comparatively good resistance to halo blight and angular leaf spot, better cropping capacity than Hawkesbury Wonder in hot weather, and maintenance of an attractive appearance even to an advanced stage of maturity.—M.E.E.

McKee, E., and Musil, A. F. **Relation of temperature and moisture to longevity of seed of blue lupine,** *Lupinus angustifolius*, **Austrian winter field pea,** *Pisum sativum arvense*, **and hairy vetch,** *Vicia villosa*. *J. Amer. Soc. Agron.* **40.** 459-65. 1948. [Div. of For. Crops and Diseases, Bur. Pl. Ind., Soils, and Agric. Engng] **1289**

Conditions under which deterioration occurred are stated. Blue lupin seed under high humidity deteriorated more rapidly than did Austrian winter field pea or hairy vetch. Blue lupin seed with constant moisture of 15 per cent showed injury after 4 hours exposure to 55°C (131°F). At higher moisture content, deterioration was greater and more rapid. Seeds of all the species stored with a moisture content of 15 per cent deteriorated rapidly when the temperature was 30°C (76°F). Lupin seed in apparently mature pods still contained 18 per cent moisture.—K.J.S.

MILLER, L. W. **Populations of *Thrips tabaci* Lind. on bean varieties.** *J. Aust. Inst. agric. Sci.* **13.** 141-2. 1947. [Dept. of Agric., Hobart, Tasmania] **1290**

Early in 1947 severe thrips damage was noted on certain varieties of *Phaseolus vulgaris* grown in Tasmania. Results in a varietal trial showed that *T. tabaci* attacked Hawkesbury Wonder beans to a significantly greater extent than was the case with fourteen other varieties. It was apparent that the extreme hairiness of the leaves on the Hawkesbury Wonder plants created a favourable microclimate for the insects by protecting the nymphs from attack by larger natural enemies.—M.E.E.

STANGANELLI, M. Composizione chimica dei semi di *Orobanche speciosa* DC. (=*O. crenata* Forsk.). [**Chemical composition of the seeds of *Orobanche speciosa* DC.** (=*O. crenata* **Forsk.**).] *Ann. Sper. agrar.* **1.** 97-114. [English summary, p. 112] 1947. **1291**

Results of chemical analysis of seeds of *Orobanche speciosa* DC., a parasite of horse-beans, which should be ranged among oil-yielding seeds, are reported.

A preliminary microscopic examination of the different parts of the seed is made, particularly of the protective integuments, the nature of which is defined. Critical considerations are hereby derived on the experiences carried out by other authors on the germination of these seeds in presence or in absence of roots of the host plant.—From Author's summary.

MYERS, Amy. **"Hollow heart": an abnormal condition of the cotyledons of *Pisum sativum* L.** *Proc. int. Seed Test. Assoc.* **14.** 35-7. 1948. [Sydney, Australia] **1292**

This abnormal condition [termed marsh spot by other authors, according to note by editor of the *Proceedings*] has been treated effectively with Spergon, a fungicidal dust (active principle is tetrachloroparabenzoquinone). Dusting did not have any appreciable influence on final weights of seeds but the more vigorous growth of the plants is due to the dust's protectant quality.—M.H.

HAUSEN, S. S. v. **On the role of growth substances in higher plants.** *Physiol. Plant.* **1.** 85-94. 1948. [Lab. Foundation For. Chem Res., Biochem. Inst. Helsinki] **129**

A new technique, devised to eliminate vitami C produced in pea seedlings during germinatio employs seedlings in which the cotyledons a removed 4-5 days after sowing. The method wa used in a study of growth substance activity o cotyledonless peas grown in light. Many of th factors of the vitamin B complex, biotin, yeas extract and vitamin C showed growth-promotin powers; vitamin C alone caused flowering cotyledonless plants.—K.J.S.

OIL CROPS

VALLE, O., and MALI, Liisa. Öljypellavan vi jelyn alkutaipaleelta Suomessa. [**The fir attempts to cultivate oil flax in Finland. Th quality of the seed produced in 1942.**] *Maata loustiet. Aikakausk.* **17.** 144-56. [English sum mary, p. 156.] 1945. [Cent. Agric. Res. Sta Tikkurila, Finland] **129**

When, in consequence of the war, the growin of oil plants was started in Finland in 1942, th principal centre of cultivation was in the south west, where the growing season is longer than it farther north. For the first year Argentine o flax was grown, occupying only about 400 h As linseed ripens relatively late after cereals whe the weather is rainy and night frosts set in, th quality of the seed harvested in 1942 was examine

The moisture content of the seeds was fairl high, on an average 12.4 per cent, purity was 92. per cent (free of weeds 2.3 per cent). The princip weed seed adulterants were *Galeopsis* spp. an *Chenopodium album*. The fact that in the autum of 1942 night frosts set in before the linseed wa fully ripe had an unfavourable effect on germin tion capacity, which was only on an average 4 per cent, the seed being useless for sowing.

In the original Argentine material sown dow in 1942 the oil content was 44.6 per cent of th dry matter and the crude protein content 21.7 pe cent. In the seed which was studied from twent five subsequent cultures the average oil and crud protein content was 43.3 and 22.9 per cent. I isolated cases the oil content rose to over 46 pe cent. The oil industry was well satisfied with th first year's linseed crop.—O.V.

ELIASSON, S. Försök med oljeväxter. [**Tria with oil plants.**] *Försök Forskn.* **5.** 41- 1948. **129**

During the last war Sweden was able indigenous cultivation of oil crops to make a effective contribution to her fat supply. In 194 oil crops were harvested from 8000 ha., and 1944 the area exceeded 44,000 ha. Subsequentl a decline was to be noted, but in 1947 there was a increase again to nearly 43,000 ha.

At first, white mustard predominated but from 1944 oil flax has occupied the largest area. In 1947 there was again an increase in the white mustard area. In 1943 spring rape cultivation was begun on a large scale and has remained constant since. Poppy cultivation has declined more and more since 1944 when it attained its greatest distribution (2760 ha.). The area of harvested autumn sown oil crops has fluctuated markedly owing in part to varying overwintering conditions.

Preliminary results of trials conducted by the Central Association of Sweden's Oil Crop Growers are presented.—R.P.J.

Blackman, G. E. **The future of oil seed crops.** *Farming* **2.** 205-7. 1948. [Oxford Univ.] **1296**

This is a discussion of the future of oil seed crops in Great Britain. Research has shown that linseed seedlings are relatively frost-resistant and can be sown in late March thereby escaping the worst effects of spring droughts. A further recent development has been the evolution of techniques for the selective control of annual weeds in linseed with some of the newer herbicides. In the south and east of England the variety Royal should average 12-14 cwt. of seed per acre with a maximum of over a ton, and in the north and west where earliness in ripening is essential, the variety Redwing should average 10-12 cwt. Still higher yields should be achieved with greater familiarity of the crop and a better understanding of the adjustments and techniques of harvesting.

The climate of the south and east of England is particularly suitable for sunflowers and the level of seed yield (an average of 10 cwt. on the chalk to 10-15 cwt. on the better lighter soils) is much greater than that reached in the USSR, the Argentine and Canada. Sunflowers cannot, however, be handled with ordinary farm machinery and unless combined direct, the cost of collecting the heads by hand is too large. The dwarf varieties Jupiter and Pole Star selected from USSR varieties, are the ones normally grown at the present time.

Research on poppies is now in its third year and it has been established that there are dwarf varieties which are sufficiently early to ripen in the south of England, even from a relatively late spring sowing. There is evidence that high yields can be achieved and as the seed may contain nearly 50 per cent of oil, it is thought that the poppy crop is potentially capable of producing more oil per acre than linseed or sunflowers. On the other hand poppy seed is minute and the sowing of seed at a shallow enough depth presents difficulties even on a fine level seed-bed. Germination is also apt to be slow and weeds in the seed bed may be a problem.

Soybeans ripen in Britain but those that have been grown are all dwarf types with clusters of pods set so close to the ground that they cannot be cut mechanically. If soybeans are to have a future in England they must await the selection of taller and improved varieties suitable for mechanical harvesting.

Oil seed rapes are subject to attack by flea beetles and pollen beetles and their control adds cost to production. No judgment can be passed on these until more facts are known.—G.M.H.

Clydesdale, C. S., and Burns, S. G. **Linseed growing.** *Qd. agric. J.* **66.** 133-7. 1948. **1297**

This is a memorandum on the growing of the flax (*Linum usitatissimum*) plant in Queensland for the production of linseed as a cash crop. Linseed may be used in the normal crop rotation and the husbandry of the crop differs but little from that of wheat. Trials in southern Queensland indicate that satisfactory yields of good quality linseed are possible in hot regions with a poor rainfall distribution provided care is taken in the selection of the variety and in the methods used for preparing the seed bed. Notes are given on the preparation of the seed bed, trials with various plant varieties (Ameliore, Abyssinian, Bolley Golden, Ghahreh, Malabrigo, Morocco, Rio and Walsh) rate, time, method and depth of sowing, harvesting, and diseases and pests.—G.M.H.

Watson, S. J., and Wannop, A. R. **Linseed.** *Scot. J. Agric.* **27.** 121-5. 1948. [Edinburgh and E. Scot. Coll. Agric., N. Scot. Coll. Agric.] **1298**

There have been few accurately recorded experiments to measure the potentialities of linseed under varying conditions in Scotland, and none with the improved varieties now available. Trials at Boghall Experimental Farm, the experiences of three growers in the Lothians and certain trials in the north-east of Scotland are described. The six varieties, Indian, Redwing, Royal (Dunns), Royal (Webbs), England blue-flowered and Dutch white-flowered were grown at Boghall on ground that was rather badly infested with redshank. The linseed seemed unable to smother the weed and Indian, a short-strawed variety was particularly unsuited to withstand weed competition.—G.M.H.

Valle, O. Öljykasvien viljely. [**Cultivation of oil plants.**] 1943. pp. 95. [Received 1948] [Prof., Cent. Agric. Res. Sta., Tikkurila, Finland] **1299**

The growing of oil plants in Finland started in 1942. This brochure was written to help the farmer with this new type of culture. It is based upon experiments and the experience gained in trials conducted by the author since 1939.

The brochure contains in the first place the results of trials of *Linum usitatissimum*, which proves one of the most reliable oil plants for conditions north of 60° in Finland. Two varieties have been shown to be of value, namely, Argentine oil flax, the seed yield of which in 1939-1942 trials was 1640 kg. per ha., with an oil content of 38.5 per cent of the dry matter, and the Netherlands variety Concurrent, which gives a valuable yield of both seed and fibre. As the cultivation of oil plants takes place farther north in Finland than anywhere else, experiments in different times of sowing and harvesting have also been made for several years. Since the Argentine oil flax is relatively late in ripening it is important to sow it as early as possible: in the trials the first sowing took place about May 17th. The seed yield was highest and the quality best in the earliest sowings. According to the experiments in different times of harvesting, one can harvest oil flax at a relatively early stage, about 2 weeks before full maturity, without reducing either seed yield or oil content.

The work contains information also on the growing of *Papaver somniferum* (the varieties Peragis and Mahndorf), *Sinapis alba*, and short notes on the possibility of growing annual rape, turnip rape, *Brassica juncea* and *Camelina sativa*.

The price of oil seed in Finland is based on the price of rye: for seed of *Linum*, *Sinapis* and *Brassica* the price is 3.5 times the price of rye; the price of *Papaver* is 5.5 times that of rye.—O.V.

CROCIONI, A. Germinazione a bassa temperatura dei semi delle piante oleifere. [**Germination at low temperature of seeds of oil plants.**] *Ital. agric.* **84.** 28-30. 1947. **1300**

Trials in relation to lowest germination temperature have been carried out at the laboratory of the Agronomy Department, Bologna University, on 16 different species or varieties of the principal oil plants. Results of the two series of trials (at 2-3°C. and 5-6°C.) are tabulated.—E.B.

DARPOUX, M. H. Essais de traitements contre la rouille du carthame. [**Trials of treatments for control of rust in** *Carthamus*.] *C. R. Acad. Agric. France* **34.** 131-4. 1948. [Stat. Centrale de Pathologie végétale, Versailles] **1301**

Carthamus tinctorius has, since the war, been cultivated in south-eastern France to the extent of 4 to 5 ha. per farm. The most important disease is due to *Puccinia carthami*. The control technique, which consists of treating the seeds with fungicides, to prevent development of teleuto spores which are attached to the seeds, is described. Several fungicides, used in powder form, have been tried and results are given.—D.B.

FIBRE CROPS

PANSE, V. G., and SHALIGRAM, G. C. **Improvement of statistics of cotton production in India** *Indian Cotton Grow. Rev.* **1.** 119-42. 1947 [Inst. of Plant Industry, Indore] **130**

Present official forecasts of cotton productio are based on the three factors, area, normal yie and seasonal condition. Experiments for estimating cotton yields by the random samplin method have been in progress in Central Province since 1942 and have clearly demonstrated th feasibility of the method. The yield survey undertaken are described in detail and comparison are made between the official forecasts for surve plot yields and the actual yields of cotton obtaine from them. During the course of the surveys dat relating to the nature of soil, crop rotation, manuring, cultivation, varieties and crop mixtures hav also been recorded. The spread of improve varieties of *Gossypium* spp. is important whe considered statistically and a varietal classification of the survey fields is presented.—M.E.E.

SETHI, B. L. **Review of work done on cotto in the U. P.** *Indian Cotton Grow. Rev.* **1.** 34-8 1947. [U. P. Dept. of Agric.]

DORASAMI, L. S. **Review of work done on cotto in Mysore.** *Indian Cotton Grow. Rev.* **1.** 3 1947. [Mysore Dept. of Agric.]

KHURSHID, A. B. H. **Review of work done o cotton in Hyderabad.** *Indian Cotton Grow. Re* **1.** 40-2. 1947. [Dept. of Agric., Hyderaba State] **130**

These three reviews give information o varieties of cotton grown, yield data, problems c cultivation, results of improvement work alread achieved and schemes of future research. In th United Provinces the cotton grown is mainly short-stapled inferior type but an improved *des* cotton variety and a Perso-American type ar slowly being distributed. The proposed irrigation projects in the Ganges and Jumna valleys wi permit the cultivation of long staple *Gossypiun* spp. but at least 40 per cent of the cotton area wi remain rainfed and must be supplied with a mor productive *desi* cotton variety. The improvemen of American cottons in Mysore has resulted in a extremely drought resistant strain known a M.A.V. which yields 715 lb. of lint per acre. Wor is also progressing on the acclimatization an improvement of Egyptian and Sea Island cotton in this State and manurial trials have indicate the importance of nitrogenous fertilizers. Hyde abad is responsible for 15 per cent of the area an 10 per cent of the production of cotton in Indi and work done with various varieties grown i different climatic tracts is described.—M.E.E.

FREDERIKSEN, P. S. Kvaliteten i vore spindhørafgrøder. [**Quality in Denmark's fibre flax crops.**] *Ugeskr. Landmn.* **93.** 403-6; 423-5. 1948. **1304**

In Denmark the fibre flax area increased from 10 ha. in 1928 to 8448 ha. in 1945. The increase was greatest in the early years of the last world war, when import of sisal and hemp ceased. During that rapid development no attention was paid to quality, but with a return to normal conditions Danish grown crops must be of such a kind that they can be used for the manufacture of linen.

A good fibre flax crop should be 75-80 cm. high and should be a yellowish green colour when pulled. The dimensions of the straw should be uniform for the whole crop. The straw should be only slightly branched, with 1 to 3 capsules per plant. The crop should be free from disease, and from weeds. Cultivation measures and their influence on quality and quantity of fibre are discussed under the headings: preceding crop, nitrogenous manuring, potash manuring, phosphoric acid manuring, and sowing.—R.P.J.

LENGLEN, M. La culture du coton en France. [**Cultivation of cotton in France.**] *C. R. Acad. Agric. France* **34.** 47-55. 1948. **1305**

A brief documented account is given of the cultivation of cotton in France from the middle of the 16th century to the present time. Frosts are now considered to be the great hazard. In order to harvest before the end of October it is necessary to sow before the end of March. But mid-April is the earliest safe date for sowing and this would result in the crop maturing too late. Cotton cultivation in France centres round the development of a variety suitable to the climate and acceptable to the spinners. It is not yet an economic proposition in France.—D.B.

TOURGAY, N. La récolte cotonnière de 1947 en Turquie. [**1947 cotton harvest in Turkey.**] *Cot. Fib. trop.* **3.** 32. 1948. **1306**

Unfavourable climatic conditions (drought and wind) have damaged the cotton yield of the Tchoukourova region which is estimated at 110,000 bales for an area of 189,325 ha. A good harvest is foreseen for the Aegean region where cultivations are mostly irrigated. It is reckoned it will reach 70,000 bales on an area of 36,630 ha. The total harvest for this year in Turkey is estimated at 221,000 bales (44,200 tons).—E.B.

LHUILLIER, J. Généralités sur la production cotonnière en A.E.F. [**General information on cotton production in French Equatorial Africa.**] Cot. Fib. trop. **3.** 20-8. 1948. **1307**

In 1938, 480,000 tons of plant textiles were imported into metropolitan France and 40,000 tons into French colonies. French production gives only 8 per cent of metropolitan requirements, largely supplied as cotton by French Equatorial Africa (Chad and Ubangi-Shari territories). Tables show the production of the different regions from 1926 (when cotton was first introduced into F.E.A.) to 1947. In 1945-46 season 25,000 tons of an American cotton (Triumph and Allen varieties) were produced on 250,000 ha. of land by the work of 500,000 men. The importance of developing cotton cultivation is stressed. Several improvements, such as utilization of seeds for oil extractions, and the improvement of transport, are suggested.—E.B.

QUINTANILHA, A. **The problem of cotton production in Portuguese Africa.** *S. Afr. J. Sci.* **44.** 44-9. 1948. [Centro de Investigaçao Cientifica Algodoeira Lourenço Marques] **1308**

Rising world prices and the world-wide building up of cotton stocks were the major factors contributing to the rapid development of cotton growing in the Portuguese Empire, especially after 1935. During the last five years Angola and Mozambique together have exported an annual average of more than 24,000 tons, all of which was consumed by the Portuguese textile industry. Until 1932 the contribution of the Colonies in supplying the national market was always below 10 per cent of the total imports but it has increased since to almost 90 per cent.

Average staple of Mozambique cotton is 1⅛ in., Angola cotton is a little shorter, varying between fifteen-sixteenths in. and 1⅛ in. Varieties cultivated are derived for the most part from Barberton varieties. In Angola the Triumph Big Bo is still under cultivation in one of the zones.

All cotton is cultivated on dry land despite the irregular and unreliable nature of the rainfall. Under such circumstances, average yields are low, in Mozambique about 190 lb. seed cotton per acre and in Angola about 199 lb.—G.M.H.

MAHTA, D. N. **Cotton growing in India.** *Indian Cotton Grow. Rev.* **1.** 1-9. 1947. [Indian Cent. Cotton Comm., Bombay] **1309**

An account of the cultivation of *Gossypium arboreum*, *G. herbaceum* and *G. hirsutum* in India is accompanied by notes on the research work carried out to improve these types of cotton. Yearly variations in yield and staple are tabulated for different growing districts, and it is evident that the proportion of cotton of staple length 0.875 in. and above to the total production, increased from 37 per cent in the year 1938-39 to 66 per cent in 1944-45. The present statistical position of Indian cotton is reviewed and the possibilities of future developments in production are discussed.—M.E.E.

Sankaran, R. **Cotton growing in Sind.** *Indian Cotton Grow. Rev.* **1.** 107-16. 1947. [Cotton Res. Sta., Mirpurkhas, Sind] **1310**

A brief historical account of cotton growing in this area is augmented by statistics showing the recent progress of its cultivation and the climatic conditions which prevail throughout the province. The stages of growth are strictly controlled by the climatic conditions and the optimum time for sowing the American *Gossypium* spp. varies according to the tract of country. In most districts flowering commences by the middle of June and the later stages of ball maturation take place during September and October. Under perennial irrigation the crop received 37 acre-inches distributed as follows: a soaking dose of 8 in. prior to sowing; a first irrigation of 4 in. when 40 days old and a second of 4 in. 3 weeks later; seven subsequent irrigations of 3 in. each at fortnightly intervals until the end of September. This abundance of irrigation water creates a severe weed problem and the successful eradication of weeds would considerably improve the cotton yields in Sind.

A three-year rotation is usually practised with cotton and wheat followed by fallow. The introduction of green manuring and the application of nitrogenous manures are measures capable of effecting increased yields. Four types of Sind "deshi" cotton are grown consisting of genotypes belonging to the species *Goarboreum* var. *neglectum* forma *bengalensis*. Roseum is hardy, high-yielding high-ginning strain which is exported abroad for admixture with wool in the manufacture of blankets. Details of the fibre and spinning properties of Punjab-American strains of *G. hirsutum* are also given and research schemes for improvement of these types are in progress. Long-staple Egyptian and Sea Island cottons belonging to the species *G. barbadense* have also been tested in Sind but their susceptibility to unfavourable climatic changes has limited their development and new *barbadense-hirsutum* hybrids are being sought. —M.E.E.

Panse, V. G., and Sahasrabudhe, V. B. **Yield of rainfed cotton and its improvement.** *Indian Cotton Grow. Rev.* **1.** 10-8. 1947. [Inst. of Plant Industry, Indore] **1311**

Although India is the second cotton producing country in the world, its acre yields are the lowest and cause grave concern among the authorities. Limitations are imposed on good production by the general poor level of soil fertility, by wide fluctuations in the climate and by an inadequate seed distribution organization coupled with unsuitable cultivation periods.

A survey of cotton yields was conducted in the Central Provinces and the average yield of seed cotton in lb. per acre was related to soil depths in different districts. Effects of growing cotton on ridges were noted and an increased yield of 6 per cent was obtained which was not sufficient to warrant the practice with a rainfed crop on the grounds of economy. Yields at Government farms in the same area were much higher than those of the surrounding districts, due mainly to better cultivation practices and liberal manuring. The importance of wise crop rotation was clearly demonstrated during the survey and *Trifolium alexandrinum* proved very suitable for rotation with *Gossypium* spp. Nitrogenous manuring with oil cakes, particularly groundnut, and ammonium sulphate, and the careful suppression of weeds were among the chief methods of increasing cotton yields.—M.E.E.

Patel, G. B. **Cotton improvement in South Gujerat (Bombay Province).** *Indian Cotton Grow. Rev.* **1.** 19-21. 1947. [South Gujerat, Surat] **1312**

In this area, where cotton occupies more than 30 per cent of the total cultivated area, the soils are black clays which expand after rain and show wide cracks on drying thus allowing a constant admixture with the subsoils. Rainfall varies from 30 to 50 in. and occurs entirely from June to October with a maximum in July. Under these conditions the usual rotation is *Gossypium* sp. followed by *Sorghum* sp. which is sometimes mixed with *Cajanus indicus*. Average yield of seed cotton amounts to only 360 lb. per acre harvested in three pickings. The *herbaceum* variety grown in Gujerat is easy to gin although the outturn is only about 30 per cent. Cotton improvement has concentrated on selection and hybridization of the local varieties, and new types are now becoming available which combine a silky texture and good staple length with satisfactory yield and high ginning percentage. New cotton types are also being tested for use in certain areas where *Fusarium vasinfectum* calls for wilt resistant cottons.—M.E.E

Afzal, M. **Problems in cotton improvement in the Punjab.** *Indian Cotton Grow. Rev.* **1.** 50-9 151-7. 1947. [Cotton Res. Lab., Lyallpur] **1313**

Extreme, continental climatic conditions set a limit to the growth of cotton in the Punjab Although the acreage has increased tremendously in recent years, it is by virtue of the high yield obtained that cotton holds such an important place in the agriculture of the province. Both *desi* and American varieties are grown, the former belonging to *Gossypium arboreum* var. *neglectum* forma *bengalensis* and the latter American upland types being *G. hirsutum*. The history of the development of these species is traced and their ecological relationship to different Punjab zones is explained Improvement problems are concerned with yield ginning outturn, staple, resistance to pests and diseases and cultural practices. New efforts are being made to increase yields and staple length by varietal selection, and to be successful, varieties grown must be resistant to *Empoasea devastans* and *Bemesia tabaci* as well as to root rot and leaf spot diseases.

The second article deals with improvement of yield and production in the Punjab as compared with that in other parts of India. Areas and yields per acre in the Punjab are traced for a period of 20 years and the work of introducing high-yielding varieties and better agronomic practices is described.—M.E.E.

BALASUBRAHMANYAN, R., and SUNDARAM, S. **A review of experiments with legumes preceding cotton in the Madras Province.** *Indian Cotton Grow. Rev.* **1.** 87-95. 1947. [Dept. of Agric., Madras] **1314**

Although breeding for higher output continues to be the chief aspect of cotton improvement work in India, modifications in the existing cotton agronomy can bring about more rapid and bigger changes than mere varietal substitution. Experiments are reported from five research stations and the seed cotton yields obtained in the different rotations are presented. Among the preceding crops used were *Cicer arietinum*, *Pennisetum typhoideum*, *Sorghum* spp., *Eleusine coracana*, and *Arachis hypogea*. At Coimbatore the highest average yield of 828 lb. of seed cotton per acre followed the growth of *Crotalaria juncea*. Mixtures were also tried but did not benefit the succeeding cotton, while crops grown the same year in association with cotton depressed the yield of fibre even in favourable seasons. For future trials pulses such as *A. hypogea*, *Cajanus cajan*, *Cicer arietinum* and *Dolichos biflorus* for seed are recommended, while *Phaseolus trilobus*, *Indigofera anil* and *Cyamopsis tetragonoloba* are the most suitable green manure crops to precede cotton. Possibilities for using *Capsicum annum* in a mixture with cotton and *A. hypogea* with a cereal in a three course rotation are offered on the grounds of economical returns and wise cropping policy.—M.E.E.

MADRAS, DEPARTMENT OF AGRICULTURE. **Indigo as a corrective for the ill effects of sorghum.** *Indian Cotton Grow. Rev.* **1.** 33. 1947. **1315**

The two cereals commonly rotated with *Gossypium* sp. in certain districts of Madras province are *Pennisetum typhoides* and *Sorghum dochne*. The latter crop reduces the subsequent yield of cotton in the rotation especially if the crop is ratooned. These deleterious effects are attributed to an increased sodium content resulting in alkalisation of the soil especially during the later growth stages of *S. dochne*. Sulphur, gypsum and magnesite are unsuitable as correctives under the rainfed conditions, but the application of animal and nitrogenous manures to the cotton crop considerably improves the yield. Even better results, however, are obtained by growing *Indigofera* sp. in association with the preceding *Sorghum* crop. About 12 lb. of indigo seed per acre should be incorporated when sowing the *Sorghum* which is usually harvested in March. By May the indigo crop is ready for ploughing in and cotton yields of the following season are increased about 16 per cent by this procedure.—M.E.E.

KHADILKAR, T. R. **Breeding of high ginning Jarila cotton.** *Indian Cotton Grow. Rev.* **1.** 64. 1947. [Dept. of Agric., Bombay] **1316**

For the past 10 years the Jarila variety of cotton has been multiplied throughout Khandesh until it now covers almost the entire tract. It is highly wilt resistant, yields from 300 to 500 lb. of seed cotton per acre, has an average ginning percentage of 35 and a staple length of 0.75 to 8.25 in. Even better yields and higher ginning outturn have been produced by crossing Jarila with other cotton types and large scale district trials are to be conducted with these new crosses.—M.E.E.

GADKARI, P. D., DEO, K. G., and NADKERNY, N. T. **Studies in the genetic consistency of Gaorani 6.** *Indian Cotton Grow. Rev.* **1.** 65-76. 1947. [Dept. of Agric., Hyderabad State] **1317**

Since its release in 1938 this improved strain of *Gossypium arboreum* var. *neglectum* forma *indica* has gained remarkable success among growers in Hyderabad. In the present genetical studies random samples of Gaorani 6 from the second to the seventh generations were obtained from the 1942-43 crop, and randomised blocks were seeded in the following three seasons. Observations were made on several agronomical characters and technological properties and analyses are presented. No genetic changes were noted during multiplication of this strain up to the seventh stage with regard to viability, yield, earliness, plant vigour, staple length, weight of seeds, fibre weight, swollen hair diameter, fibre maturity and spinning performance.—M.E.E.

RAJULU, K. D. **Introduction of Cambodia cotton in the Ceded Districts of Madras Province.** *Indian Cotton Grow. Rev.* **1.** 84-6. 1947. [Indian Cent. Cot. Comm., Bombay] **1318**

About two-fifths of the Madras Province cotton acreage lies within the Ceded Districts where five varieties of cotton are cultivated. There are two types of *Gossypium herbaceum* var. *frutescens*, *G. arboreum* var. *neglectum* forma *indica*, *G. hirsutum* and *G. arboreum* var. *neglectum* forma *bengalensis*. Only the last of these, or Mungari cotton has a good yield and reasonable ginning outturn but its lint is short and coarse and only suitable for low counts. A scheme to evolve a long stapled American variety capable of giving high yields when grown as a winter irrigated crop was initiated and work also commenced on breeding an exotic type for the unirrigated areas. Trials were conducted on different soil types and many new imported varieties have been tested. Preliminary results indicate that the best planting time for American varieties is from mid-August until mid-September. The Hyderabad-American 11 variety proved most consistent in yield and quality and other desirable characters, and many single plants have been selected for further study. —M.E.E.

Sen, D. L., and Ahmed, N. **Effect of manurial treatment on the yield, fibre properties and spinning value of cotton.** *Indian Cotton Grow. Rev.* **1.** 45. 1947. [Technological Lab., Bombay] **1319**

Two fields of Cambodia cotton (*Gossypium hirsutum*) were divided into plots and treated with nitrogenous, potassic, and phosphatic fertilizers for two successive seasons. These fertilizers produced heavy increases of cotton yield where the soil was poor but the increases were insignificant on rich soil already adequate for plant nutrition. Fibre properties were little changed by fertilization but the results of spinning rests showed that less neppy yarns were produced on the poor soils when fertilized. In the majority of cases the ash content of cotton increased as a result of manurial treatment but the effects on other chemical constituents of cotton fibre were irregular.—M.E.E.

Narayanayya, D. V. **Effect of application of small doses of nitrogen to cotton.** *Indian Cotton Grow. Rev.* **1.** 143-50. 1947. [Cotton Res. Sta., Nanded] **1320**

From 1943 to 1945 a manurial experiment with three levels of nitrogen treatment was carried out using plots of the Gaorani 6 cotton variety. Two methods of nitrogen application were employed; the sown seed was either coated with fertilizer or the manure was drilled in the furrow together with the seed at sowing time. Data was collected relating to germination, final stand, yield of fibre and earliness. Ammonium sulphate sown by either method depressed the germination especially during a dry year and when the coating method was employed. When applied at 5 lb. of nitrogen per acre the fertilizer significantly increased yields whether the seed was coated with the fertilizer or drilled with it, and earliness was also increased significantly.—M.E.E.

Fielding, W. L. **Experimental methods with cotton. V. A study of ginning percentage and its determination in variety trials.** *J. agric. Sci.* **38.** 154-7. 1948. [Emp. Cott. Gr. Corp., Cott Expt. Sta., Barberton, S. Africa] **132**

This is a study of data obtained from experiments connected with selection work in the U family of Upland cotton. Data was obtained fro three variety trials in three different seasons 1934-35, a dry year; 1938-39 and 1939-40, tw years of higher rainfall. Each trial was compose of a different range of strains derived from th jassid-resistant Upland U4; the parent U4 bul appeared in the 1934-35 experiment.

It was concluded that it is satisfactory to determine ginning percentage from samples (as oppose to using the whole production of variety trial plots) and that the samples need not excee 200 gm. Sampling at the scale was found to b the most accurate of the three methods trie In general the use of composite samples give reasonably satisfactory estimates of error. Th procedure also leads to saving in time and labou —G.M.H.

Fielding, W. L. **Experimental methods wit cotton. VI. The determination of staple-lengt in single plant selections and variety trials.** *J agric. Sci.* **38.** 158-62. 1948. [Emp. Cott Grow. Corp., Cott. Expt. Sta., Barberton, S Africa] **132**

Studies of different methods of staple-lengt measurement, of the comparative accuracy of th measurements made by three persons and of th number of seeds which it is necessary to measur so as to obtain various degrees of accuracy in th determination of differences are presented.—G.M.H

Afzal, M., and Nawaz, S. M. **The staple characteristics of the Punjab-American cotton crop** *Indian Cotton Grow. Rev.* **1.** 22-5. 1947 [Cotton Res. Lab., Lyallpur] **132**

The staple characteristics chosen for th present study were length, fineness and highes standard warp counts. Areas under seven differen varieties of Punjab-American cotton have bee estimated each year from 1921 till 1945. Durin the first 10 years of this period there was n improvement, but from 1931 onwards the bette varieties were increasingly grown in India, an staple characteristics were correspondingly improved. Whereas the average spinning performance was thirty-seven highest standard warp coun in 1945, the figure in 1921 was only twenty-fou Two of the new varieties responsible for this improvement were Victory and 199 F both of whic were produced in the Punjab.—M.E.E.

Gulati, A. N. **Neppiness in Indian cotton yarn** *Indian Cotton Grow. Rev.* **1.** 60-3. 194 [Technological Lab., Bombay] **132**

Neps, or small clusters of entangled fibre are attributed to faulty ginning, scutching an carding. They have been traced to dead or immature fibres produced on under-developed seeds. Twenty-one samples of yarn were analysed and these covered a wide range of counts from 6 to 40 and represented the commonly cultivated species in India *Gossypium hirsutum*, *G. herbaceum* and *G. arboreum* var. *neglectum*. From the data six different types of neps were recognized and details are given regarding their particular features which are illustrated in highly magnified plates. Neps can be reduced by the elimination of strains of cotton containing an excessive number of immature hairs, by the selection of hard seeded and more mature cottons and by clean picking. Other factors which contribute towards nep production are linked with more efficient machinery and suitable dyeing techniques.—M.E.E.

VENKATARAMAN, V. **Pre-cleaning and ginning tests on Indian cotton.** *Indian Cotton Grow. Rev.* **1.** 30-1; 158-62. 1947. [Technological Lab., Bombay] **1325**

A summary of results from tests on twelve Indian *Gossypium* spp. One English and two American cotton-seed openers were tested for their effects on the ginning properties of the different varieties, and the pre-cleaning outputs of each machine were compared. Ginning experiments were also conducted on three machines which were the saw gin, double roller gin, and single roller gin. Both roller types gave higher ginning percentages than the saw gin for the majority of varieties, but in some cases the saw gin yielded lint with stronger yarn and more regular fibre-length than that produced from roller ginned samples.

The effect of using different saw speeds in the saw gin and the effect of employing different overlaps and grid sizes in the roller gins are discussed in the second article. With the saw gin increase in speed resulted in progressive increase of output and no significant changes in fibre quality were caused by varying the speed of the saw gin or by changing the overlaps in the double and single roller gins.—M.E.E.

SEN, D. L. **A note on the qualitative method for the identification of Punjab-American and Mollisoni (*Desi*) cottons in a mixture of the two.** *Indian Cotton Grow. Rev.* **1.** 43-4. 1947. [Technological Lab., Bombay] **1326**

The prevalent malpractice of mixing inferior quality cotton with the superior Punjab-American product led to the present experiments to determine the exact percentage of mixtures by a qualitative method. Fibre weight per unit length and rigidity are factors which vary considerably within the varieties and cannot be relied upon as criteria for determining mixture percentages. The chemical analysis of the two cottons also varied insignificantly and so experiments were conducted on the absorption of basic dyes by Punjab-American 4F and Mollisoni *Gossypium* spp. in raw condition. Methylene blue was first used as a basic dye and this was followed by the direct dye Chlorazol fast red. The exact method is described and the result of the treatment is to give the superior cotton a pink shade while the inferior *desi* cotton remains blue in colour.—M.E.E.

RAPPARD, W. F. van. Nieuwe mogelijkheden voor de productie van bastvezels. [**New possibilities in the production of bast-fibres.**] *Landbouwk. Tijdschr.* **60.** 165-70. 1948. **1327**

A discussion is presented of mechanical-chemical methods of processing flax (*Linum usitatissimum*), jute (*Corchorus* spp.), and ramie or China grass (*Boehmeria nivea* var. *tenacissima*), with special reference to the effect of such methods upon the cellulose, the most important component of the cell wall.—G.M.R.

COMMONWEALTH ECONOMIC COMMITTEE. **Industrial fibres.** 1948. pp. 137. [Int. Branch, Commonw. Econ. Cttee] **1328**

A summary of figures of production, trade and consumption relating to cotton, flax, jute, hemp, wool, silk, mohair, coir and rayon.—G.M.H.

LEPAGE, H. S., GIANNOTTI, O., and ORLANDI, A. R.B. 1018 un nouvel insecticide. [**R.B. 1018 a new insecticide.**] *Cot. Fib. trop.* **3.** 3-14. 1948. **1329**

The results of a number of experiments carried out at the Biological Institute, São Paulo, in order to study the insecticidal properties of a new organical product, "R.B. 1018", derived from phosphorus, are described. In laboratory trials it has shown a strong toxic influence on the following cotton parasites: *Alabama argillacea*, *Aphis gossypii*, *Eutinobothrus brasiliensis*, and *Horcius nobilellus*. Field trials have also been carried out in the case of *Alabama argillacea*. This product, which has proved to be effective also on other insects, does not affect the growth of the plant.—E.B.

SUGAR BEET

BRITISH SUGAR BEET REVIEW. **Irrigation: A Suffolk trial.** *Brit. Sug. Beet. Rev.* **16.** 142. 1948. **1330**

Details are given of an irrigation experiment with sugar beet, carried out on a randomized and replicated basis at Kesgrave, near Ipswich, Suffolk. Each watering occupied about 8 hr., the volume being approximately 2 in.; dates of application varied on all ten plots. The response was very pronounced, particularly so in the case of plots which had received two applications,—the first in June.

Viewed in the light of the results of a previous trial carried out at Milford Surrey (see Abs. 1125), where over 10 inches of water was added, it is interesting to note that at Kesgrave the addition of approximately 4 in. increased the weight of beet from around 10 tons per acre to 14.5 tons with a sugar content loss of 1 per cent compared with 2.5 per cent at Milford.—G.M.H.

RAYNS, F. **Effects of seed bed on plant emergence.** *Brit. Sug. Beet Rev.* **16.** 137-9. 1948. **1331**

The sugar beet seed bed should be shallow at the time of drilling, firm underneath with a fine covering of soil. The seed should then be deposited in the ground on the firm layer of soil and in the most intimate contact with it for it is from that surface that it obtains its main supply of water for germination. To avoid badly-established plants it is necessary to ensure proper compression of the soil around the seeds after they have been drilled. This is normally obtained either by rolling with Cambridge or flat rolls, or by using single wheeled rollers behind the drill coulters and along the line of deposition of the seed.—G.M.H.

RIETBERG, H. **Sugar beet in Holland and some comments on British practice.** *Brit. Sug. Beet Rev.* **16.** 143-6. 1948. [Bergen-op-Zoom Res. Sta., Holland] **1332**

Most sugar beet cultivation is carried out in the south-west and north-west of Holland on sea clay soils varying from light to heavy. Heavy plant populations are considered one of the fundamentals of successful beet-growing and the practical optimum is kept at 30,000 plants per acre. An insufficient number of plants per acre gives a serious decrease in yields of sugar content, leaves, tops and roots. Row widths which were 13 to 16 in. wide are now increasing to 18 to 20 in. with the development of mechanization but the 30,000 plants per acre population is retained. Greater stress is now being laid on the careful preparation of the seed bed to ensure good emergence and on the singling with 10 to 12 in. between the plants in the row.

Beet tops which have a high feeding value are fed fresh, but a large proportion is ensiled to help farmers with their live stock through the winter months.

The beet eelworm has infested many fields and done great damage to the crop in the south-western beet districts and despite certain control measures it remains a serious menace to intensive beet-growing in those districts.—G.M.H.

LEROY, A. M., and ZELTER, S. Z. Étude concernant la façon d'ensiler les pulpes de betteraves sucrières. [**Methods of ensiling sugar beet pulp.**] *Ann. agron. Paris* **18.** 78-101. 1948. **1333**

See *Herb. Abstr.* 18, *Abs.* No. 926.

DECOUX, L. Mécanisation ou amélioration de la betterave sucrière ? [**Mechanization or improvement of the sugar beet ?**] *Publ. Inst. belge Amélior. Better.* **14.** 314-20. 1946. [Inst. Belge pour l'Amélioration de la Betterave, Tirlemont] **1334**

Subjects discussed include the development of a beet with a root which can be readily harvested by machine ; sheared seed ; row spacing ; weed killing with hormones ; replacing farm manure with green manure ; methods of preparing the soil, and early sowing and early lifting to avoid harvesting under wet conditions which results in excessive compression of the soil by the harvesting machinery. Sugat beet improvement and sugar beet mechanization are interrelated and must proceed side by side always with a watch on costs of production.—D.B.

DECOUX, L. Rétrospective des recherches agronomiques effectuées à l'Institut de la Betterave à Tirlemont de 1939 à 1946. [**Review of agronomic research carried out at the Institute for Beet Improvement at Tirlemont from 1939 to 1946.**] *Publ. Inst. belge Amélior. Better.* **15.** 49-54. 1947. [Inst. Belge pour l'Amélioration de la Betterave, Tirlemont] **1335**

Several of the investigations were justified by the war. They included those on the seed (size of cluster, sheared seed, vernalization); varieties (size of tops, susceptibility to disease of small topped varieties, variability of varieties, industrial value) ; fertilizers ; cultivation of soil ; and by-products.—D.B.

CULPIN, S. **Row-crop cultivation of sugar beet.** *Farm Mech.* **2.** 87-8. 1948. [Norfolk Agric. Sta.] **1336**

The two different types of bunching machines —those working along the rows and those working across—are discussed. The advantage of those working along the rows is that they can be used on beet grown on the ridge as well as on the flat, but against this there is the necessity of buying a special machine for the job. "Cross-blocking" on the other hand, can be done with the same outfit as is used for inter-row hoeing.—G.M.H.

FORREST, R. L. **Mechanised sugar beet growing.** *Scot. J. Agric.* **27.** 128-31. 1948. **1337**

This is a discussion of the mechanisation of sugar beet growing in terms of sowing, singling, hoeing and harvesting. The opinion is expressed that sowing on the flat is the correct method and that only three inches of fine soil is required. It is suggested that future developments should include aids to singling and mechanised topping and windrowing.—G.M.H.

Decoux, L. Introduction à la mécanisation de la culture de la betterave sucrière en Belgique. [**Mechanization of sugar beet cultivation in Belgium.**] *Publ. Inst. belge Amélior. Better.* **14.** 307-13. 1946. [Inst. Belge pour l'Amélioration de la Betterave, Tirlemont] **1338**

The Sugar Beet Institute of Belgium is introducing a new section for mechanization. This paper, based on observations in the United States, discusses the machinery for soil cultivation and for harvesting the beet. The need for mechanization in Belgium is becoming imperative because of the increasing shortage of agricultural workers.—D.B.

Decoux, L. En marge de l'arrachage mécanique de la betterave. [**Mechanical harvesting of beet.**] *Publ. Inst. belge Amélior. Better.* **15.** 55-8. 1947. [Inst. pour l'Amélioration de la Betterave, Tirlemont] **1339**

Mechanization can only be successful if accompanied by improvements in cultivation. For the small farmer a simple lifting machine is adequate and it would be more acceptable if the tops could be dried at a profit. For large-scale cultivation the ideal machine should combine topping and collecting of the green foliage, and the lifting, cleaning, loading and transport of the roots.—D.B.

Decoux, L. Comment faire diminuer le prix de revient de la betterave sucrière ? [**How can the cost of sugar beet production be reduced ?**] *Publ. Inst. belge Amélior. Better.* **14.** 324-30. 1946. [Inst. pour l'Amélioration de la Betterave, Tirlemont] **1340**

The chief factors which determine cost of production are : outlay, yield and revenue from by-products.—D.B.

Baratte, M. Essais de graines de betteraves segmentées au cours de la campagne 1947. [**Field trials with sheared seed of beet in 1947.**] *C. R. Acad. Agric. France* **34.** 201-4. 1948. **1341**

Germination of the sheared seed is less regular than ordinary seed, reasons for which are given. The yield of 1947 was not conclusive for or against sheared seed. The promoters of the trials recommend sheared seed only on experimental plots and not in ordinary beet farming.—D.B.

ROOT CROPS

Virtanen, A. I., Tuorila, P., Valle, O., Salminen, M., Aikkinen, I., and Jäntti, A. Rehunviljelysopas AIV-rehun valmistajia varten. [**Guide to fodder cultivation for farmers making A.I.V. silage.**] 1947. pp. 176. **1342**

Within recent years approximately eighty advisers have been working on the subject of A.I.V. ensilage in Finland. As it has been necessary to intensify the growing of forage crops so as to increase yields and to improve their quality, the above-named book has been published by Finnish experts in different fields.

Virtanen (pp. 5-20) treats the importance of forage crop production and especially of leys for animal production. By means of the A.I.V. process it is possible to produce more protein and a more valuable feeding stuff for the long periods between grazing seasons than by means of haymaking. Tuorila (pp. 21-41) stresses the importance of improving growth conditions. As approximately 80 per cent of Finland's arable land is in need of lime, very considerable increases in yield could be obtained, according to the results of trials an average of 30 per cent, by more abundant liming. Much larger quantities of commercial fertilizers should be used than before the war. There is, in particular, a great deficiency of phosphoric acid. Valle (pp. 42-107) deals first with the technique of ley cultivation on the basis of the results of experiments made in Finland in the 1930's and 1940's. In this the intensification of red clover growing is of primary importance. As the production of red clover seed has been inadequate from 1940 onwards, the first objective is the improvement of seed-growing technique with the aid of recent experimental data obtained in Finland. The commonest seeds mixture comprises *Trifolium pratense* and *Phleum pratense*, but instead of 4 to 5-year leys shorter 2 to 3-year leys should be grown, with a heavy stand of clover. The following is recommended as a normal mixture, in kg. per ha. : *Trifolium pratense*, 8 ; *T. hybridum*, 2 ; and *Phleum pratense* 20. Red clover in a pure stand cannot be generally recommended, as it is often deficient in winter hardiness. Several experiments have been made to ascertain the connexion between the wintering of red clover and the time and method of harvesting in the late summer, from August to September. The best time to cut the aftermath is the end of August, as red clover can then have time to grow again before the cold period sets in. When cutting is done in September, the herbage must be left taller than is normally the case in order not to endanger wintering. By the growing of green forage crops (peas, vetch and oats) and the so-called midsummer rye (rye and green fodder mixture sown in June), material for A.I.V. silage can also be ensured, and it is therefore of the greatest importance to conduct trials of annual forage plants. Salminen (pp. 108-135) discusses the value of growing potatoes and roots. Potatoes have given much higher and more reliable yields in Finland than turnips, swedes, and fodder beet or mangels. For this reason, they have been increasingly cultivated for fodder as well as for food from the 1930's onwards. By rationalizing cultural technique it would be possible to increase potato yield still more and to reduce the costs of production. Aikkinen (pp.136-143) deals with the importance of intensive fodder growing by means of a cropping system such as: barley/clover-timothy/ 2 years spring wheat/roots and potatoes. The rotation should be planned in fields close to the farm buildings. Jäntti (pp. 144-176) stresses the great significance of the pastures during the growing season for ensuring animal feed. His findings are based on his research into the relative value of the different types of Finnish pastures. In the field of pasture management, also, more intensive technique is being adopted.—O.V.

RUSSELL, E. W. **Why must root crops be hoed?** *Scot. J. Agric.* **28.** 10-3. 1948. [Rothamsted Exp. Sta., Harpenden, Herts.] **1343**

The results of field experiments show that hoeing is usually essential for good yields if much weed is present but it is of much greater importance when the crop is young than when it is well established, and when the level of nutrients, particularly nitrogen, is at all restricted. There is no evidence to show that the loose surface produced by hoeing is important. Hoes should therefore be set as shallow as is compatible with efficient killing of the weeds, for hoeing deeper than is necessary for this purpose disturbs or kills the superficial feeding roots of the crop.—G.M.H.

SCHWANBOM, N. Fröodlingen inom Skåne under åren 1936-1945. [**Seed production in Scania during the years 1936-1945.**] Skånes Fröodlingsförenings Minnesskrift. 1946. **1344**

In the commemorative publication issued on the occasion of the twenty-fifth anniversary of the Scanian Seed Growers' Association in 1936, L. Aronson gave an account of seed production in Scania up to that year. A report on the work during the subsequent 10-year period is now presented.

During the last 10-year period, on the average fodder sugar beet has been grown for seed on 72 ha. each year, though there have been considerable variations in the area. In 1938 the area was only 15 ha., while during the years 1942-1944 it amounted to 160, 135 and 140 ha. respectively.

During the years 1936-1940 the seed production area of Barres fodder beet was on the average 281 ha. while the corresponding figure for the last five-year period was 327 ha. Considerable fluctuations have occurred: the area in 1939 was only 10.5 while in 1943 it exceeded 500 ha. Seed yields have as a rule been good: for the period 1936-1940 the average annual yield was 220 kg. per ha. and for the last five-year period 1941-1945 it was 1800 kg.

The seed production area of the Eckendorfer type of fodder beet has been considerably smaller and the yield per ha. has been lower. During the ten-year period 1936-1945 the annual average area has been approximately 32 ha. and the average seed yield 1820 kg. per ha. Swedish seed production of fodder sugar beet, and Barres and Eckendorfer fodder beet is at present conducted on such a scale as to meet the country's requirements.

The particularly severe winters included in the last ten-year period had a very marked effect on seed production of swedes. The annual average area for the period was 142 ha. As a result of the severe and protracted winter of 1940, which was followed by a cold, dry and windy spring, practically all the swede seed plots had to be ploughed up: in that year only three plots yielded a seed crop and this amounted to but 800 kg. per ha. In 1943 the area amounted to 382 ha. with an average yield of 1200 kg. per ha. The average seed yield for the whole ten-year period 1936-1945 was 1140 kg. per ha. An area of approximately 150 ha. is sufficient to meet the country's requirements, but bearing in mind that unfavourable weather conditions occasionally make ploughing up necessary, this cultivation should be increased slightly, especially as Swedish swede strains are at a premium in the other Scandinavian countries, so that there is little risk of overproduction.

What has been stated above regarding the effect of the weather on seed production of swedes also applies to that of turnips. In 1940 every turnip seed plot in Scania was destroyed owing to the severe winter. The average area per year during the period 1936-1945 was 58 ha. and the average yield for the same time 961 kg. per ha. As there is always a risk of the crop being destroyed by cold or damaged by insects, a slight increase in turnip seed cultivation is advisable.—R.P.J.

CROP PHYSIOLOGY

LOEHWING, W. F. **The developmental physiology of seed plants.** *Science* **107.** 529-33. 1948. **1345**

In his address to the Section on Botanical Sciences of the American Association for the Advancement of Science the writer reviews the subject, noting that " the absence as yet of a thorough conspectus on the subject is evidently attributable to the diversified and dispersed character of the data rather than to paucity of knowledge on the subject . . . it is evident that the progress in our knowledge of developmental physiology during the present decade has contributed substantially to an enlightened understanding of what plants really are, what they do, and how their life cycle is implemented."—R.O.W.

ROWAAN, P. A. Zout- en chloorschade bij de verschillende gewassen. [**The susceptibility of different plants to damage from salt and chlorine.**] *Maandbl. LandbVoorlDnst* **5.** 290-300. 1948. [LandbProefsta. and Bodemk. Inst. T.N.O., Groningen] **1346**

The literature from 1926 onwards is reviewed nd recent experience in the Netherlands is sumnarized. When, after the receding of the floods, he Island of Walcheren was being resown in the pring of 1946, the soil to a depth of 5 to 20 cm. vas examined for a value designated C, which epresents the number of gm. sodium chloride per itre soil moisture, and the sowing of the different lants was only approved by the Advisory Service vhen C did not exceed certain figures of which the ollowing are some examples : spring-sown cereals, ; beet, 8 ; poppy seed, 4 ; flax, 3 ; peas and ield beans, 2 to 3. A somewhat higher figure, ossibly 12 to 15, would be permitted for autumnown cereals, as during the winter leaching of salt rom the soil is to be expected.—G.M.R.

ATKINSON, H. J., PATRY, L. M., and LEVICK, R. **Plant tissue testing. III. Effect of fertilizer applications.** *Sci. Agric.* **28.** 223-8. 1948. [Div. of Chem. Sci. Serv., Ottawa] **1347**

Results of 3 years' work on the use of plant tissue tests on widely differing fertility plots at Ottawa show some relationship between tissue tests for nitrates and crop yields. No similar relation was found with P and K. Amounts of N, P and K extracted from plant tissues grown with the same fertility and treatments but on two soils differing widely in fertility were similar but yields were not proportional ; yield from one area was double that from the other.—K.J.S.

GABRIELSEN, E. K. **Effects of different chlorophyll concentrations on photosynthesis in foliage leaves.** *Physiol. Plant.* **1.** 5-37. 1948. **1348**

Following the theory that chlorophyll concentration is a weak light factor, the photosynthetic activity of leaves of various species and varieties was determined at low light intensity. It is concluded that the chlorophyll factor has little bearing on photosynthesis in plants with fully developed foliage leaves. Chlorophyll concentration of fully developed leaves of most species exceeds the optimum value for the chlorophyll factor. In young leaves and in varieties with chlorophyll concentration lower than this value the chlorophyll factor may be of importance for the rate of photosynthesis, but even then only at weak light intensities seldom found in nature.—K.J.S.

BURSTRÖM, H. **A theoretical interpretation of the turgor pressure.** *Physiol. Plant.* **1.** 57-64. 1948. [Bot. Lab. Lund] **1349**

Theories of turgor pressure are discussed and an expression derived which is generally applicable whether the cell is at equilibrium with the external medium or not. Turgor pressure $T = O - E$ where O is diffusion pressure deficit (Meyer) of the cell sap without regard to wall pressure and E the D.P.D. of the external solution in contact with the cell.—K.J.S.

ENVIRONMENTAL STUDIES

STEENIS, C. G. G. J. van. **Miscellaneous botanical notes. II.** *Blumea.* **6.** 243-63. 1948. [Senior Botanist, Bot. Gard., Buitenzorg, Java] **1350**

Note No. 21 reports on useful plants collected by Cora du Bois in the Island of Alor, Timor Archipelago. Malaysia is poor in native food stuffs, and the collection shows that most of its important food plants have been derived from the New World flora and flourish under the favourable Malayan climatic and soil conditions. A classified and annotated list includes *Oryza sativa*, *Zea mays*, *Manihot esculenta*, various species of bean, etc. The local method of use are indicated.—G.M.R.

BOOKS AND PERIODICALS

(*For other books reviewed in this issue, see Abs.* 1217).

STAMP, L. Dudley. **The land of Britain—its use and misuse.** 29 × 23. pp. 515. London : Longmans, Green and Co., Ltd., 6 and 7 Clifford Street, W.1. 1948. 42s. **1351**

Dr. Dudley Stamp maintains that geography, the " science of man's response to his physical environment " embraces all the sciences. No longer does it content itself with descriptions of capes, bays, rivers, canals, towns, and villages, distances and heights, it also attempts to explain the details of our physical and cultural landscape in terms of surface form and underground structure of the earth's crust, climate, soils, and other natural geographical factors. Science undoubtedly helps emancipate mankind from dependence on the environment but natural conditions continue, directly or indirectly, to play a steadily increasing part in the determination of man's use of the land.

The author founded the Land Utilization Survey of Britain in 1930 and this volume summarizes the work and findings of that field-to-field survey, carried out mainly in 1931 to 1934. A description of the record made by the Survey and the general pattern of land use is followed by chapters dealing separately with the distributions of permanent grass, arable land, orchards, market gardens, moorland, heathland, rough grazings, forest, woodland, and settlements.

For the purposes of classification and mapping the Survey defined meadowland and permanent grass as " any land which had been down to grass for more than three years (thus all the Scottish six-course land appears as arable) or which it was the intention of the farmer to manage in future as permanent." Three ecological groups—basic, acidic, and neutral—are recognized and described and notes are given on the agricultural qualities of grassland, with special reference to management and use. Due attention is paid to the results of the Grassland Survey of England and Wales, organized by Sir George Stapledon and Dr. William Davies, with a discussion and description of the grassland classification used in that survey.

In the eastern counties of Britain the dominant land utilization is clearly that of arable (including grass leys of less than 3 years), the patches of permanent grass are scattered through the area and represent a type of land subordinate to the main one. Contrary to popular imagination the sale of arable crops off the farm is not the primary object of farming enterprise in these areas. Instead the crops are grown primarily for consumption by the animals of the farm and it is this that is the essential basis of operation in the various types of mixed farming which are dominant and characteristic over the greater part of Britain. The section on arable land discusses also the characteristics of good arable land and crop rotations and gives tables of figures for the principal crops in the various counties.

"Whereas in England and Wales, most of the vegetation of moors, heather and mountains can only be described as "semi-natural" and owes its essential features in large measure to stocking and grazing by domestic animals, in Scotland the effects of human interference are far less widespread. There are large areas, especially over 2000 feet, rarely traversed by the foot of man and only occasionally by his animals." The distribution of British moorland, as shown on the Land Utilization Maps is described in relation to the classification commonly used by plant ecologists and some of the uses of moorland, including grazing for animals, gathering grounds for water supplies, sporting areas, potential areas for afforestation, and recreational areas, are listed.

The chapters on surface form, climate and soils bring out essential facts that are insufficiently appreciated by farmers and many agricultural scientists. The influence of geological structure on the existence and utilization of underground water supplies and the whole problem of land drainage; the sequence which renders the climate considered as a whole, remarkably dependable; the shortcomings of normal meteorological records and observations for agricultural purposes; the importance of temperature in local climate and the need for a balance in "strictly local" climates between one field and another before a farm is a well-balanced unit, and "fertility," or productivity, of a soil being even more dependent on satisfactory water conditions than on natural content of plant food, are but a few of the points mentioned which, u to the present, have received all too little attention

The complete explanatory text prepared b the Economics Branch of the Ministry of Agriculture and Fisheries to accompany the types o farming maps of England and Wales is include in this comprehensive book and Dr. Stamp ha added an interpretation of certain points. Othe chapters discuss farms and farm layouts, th problems of land classification, the ecology an spatial distribution of certain cultivated plants an domestic animals and the various changes in lan use that took place under war-time planning i agriculture during the period 1939-45.

Having analyzed the findings of the Lan Utilization Survey and evaluated the variou factors which have determined the very comple and intricate pattern of rural Britain the autho goes on to enunciate the general principles of lan use planning, their application and the steps whic have actually been taken towards obtaining fuller and a more balanced use of the land resources of the country.

Dr. Stamp has made full use of the geographer's "tools." Maps, charts, graphs, photographs and diagrams are to be found on practicall every page and many various cartographical device have been used for the representation of statistic data. Without any hestitation this exhaustiv study of the use and misuse of our land surfac can be commended to all interested in the land o Britain.—G. M. Howe.

SPURR, S. H. **Aerial photographs in forestr** 24 × 16. pp. 351. New York: The Ronal Press Company. 1948. 36s. **135**

Aerial photographs have a wide applicatio in a number of specialized fields and forestry is on in which their use is rapidly increasing. Th photogrammetrist is concerned with the fine poin of theory and has developed very complex instruments for the construction of accurate maps. Th needs of the forester and his objectives are ver different and relatively simple but he too ha developed special methods and equipment for h purpose and in recent years has made many ne technical developments. In this book the autho brings together in a single volume a comprehensiv account of this rather specialized field.

The text is divided into four parts. Part is concerned with aerial photographs (film filters, scales, etc.). Part 2 with aerial surveyin (displacement of single photographs, stereoscop topographic mapping etc.). Part 3 with photointerpretation (techniques and principles, tr species, stand density, crown diameter, etc.) an Part 4 with the applications of air photograp to forest mapping, indirect measurement of tre and stands, volume estimation, controlling groun inventory and other planes of forest managemen

Numerous photographs and diagrams effectively illustrate the carefully selected subject matter and each section concludes with a selected bibliography. The book should occupy an important place in technical forestry literature and serve as a textbook for students in the field it covers. It should also serve as a useful reference work for practicing foresters.—G. M. Howe.

NEILSON-JONES, W. **The growing plant.** 23 × 15. pp. 206. London: Faber and Faber, Ltd., 24 Russell Square. 1948. 16s. **1353**

This is a survey of a wide range of botanical subjects written for the non-botanist, and therefore largely free from that characteristic jargon in which botanists talk to themselves and each other about the life processes of plants. Although the author states emphatically that it is in no sense a botanical text-book, it does appear that it should provide useful background reading for general biological or natural science students at a certain level.

The chapters deal respectively with plant indicators, chimaeras, growth hormones, periodicity (dormancy, time of flowering, vernalization, photoperiodism), plant nutrients, growth in soil, and reproduction. There is a useful glossary of technical terms, and each chapter has suggestions for further reading.—R. O. Whyte.

DAUBENMIRE, R. F. **Plants and environment. A textbook of plant autecology.** 22 × 14. pp. xiii + 424. New York: John Wiley and Sons, Inc., London: Chapman and Hall, Ltd. 1947. 27s. **1354**

A healthy sign in modern biological research and teaching is the number of attempts which are being made to break down the environment in which a plant has its being into its component parts, and to study the effect of these various factors alone and in various combinations with each other. This is a textbook based on a lecture course on autecology, and as such is difficult to review except on the basis of one's own teaching experience. Suffice it to say that it appears to be a broad and adequate manual on " those phases of geology, soils, climatology, zoology, chemistry, and physics which are more or less directly connected with the welfare of living organisms, and a relating of them to the structure, function and evolution of species."

The chapters deal with the factors, soil, water, temperature, light, atmosphere, the biotic factor and fire, and with the environmental complex, and ecologic adaptation and evolution. There are over 600 references to literature.—R. O. Whyte.

REPORTS

CEYLON. Administration Report of the Acting Director of Agriculture for 1945. By *L. J. de S. Seneviratne.* Colombo. 1946. pp. 39. **1355**

The report is divided into three sections dealing with agriculture in the Island, the work of the Department of Agriculture, and administration. Tea, rubber and coconuts form the main crops and much of the research work is concerned with them but plant pathological studies were also conducted with rice. Among the reconnaissance surveys conducted on Ceylon soils was that of patana reclamation which was successfully accomplished by cessation of burning and by planting *Albizzia moluccana.* This plant acted both as a windbreak and as an efficient soil renovator. Costing and variety trials were conducted with sugar-cane at the Nagoda station, and the yields of nine varieties were compared. Co. 312 variety of *Saccharum officinarum* produced 28 cwt. of sugar per acre. Other botanical work concerned cotton and kapok fibres and cereals. Numerous investigations on rice are reported including pure-line selection work, cultural and manurial trials, the economics of cultivation and various irrigation trials. In connexion with the last-named studies, intermittent irrigation did not have an adverse effect on yield and the possibilities of adopting this treatment as a method of controlling the breeding of the malarial vector during rice-growing must be further investigated.—M.E.E.

VICTORIA. State Research Farm, Werribee Experimental work and results. *J. Dept. Agric. Vict.* **45.** 337-53, 377-87 and 392. 1947. **1356**

An account is given of the scope and activities of the farm and the main descriptions fall under headings of the chief crops grown. The improvement of the yield and quality of cereal crops is one of the major concerns of the research workers, and as wheat is the most important annual crop in Victoria the chief breeding and improvement work is devoted to this cereal. Analysis of the numbers and average weights of wheat ears has enabled yield factors in the different varieties to be studied. Rajah, Ranee and Free Gallipoli all give higher yields than the older Federation variety, and the percentage survival and drought resistance of the newer wheats is also improved. Special attention is paid during breeding to milling and baking quality and to disease resistance, and the Ghurka, Quadrat and Pinnacle varieties all show marked resistance to flag smut (*Urocystis tritici*). Similar attention is paid to yield, disease resistance and milling quality in oat breeding and in breeding both malting and feed barley.

Details are given of wheat experiments and the prominent varieties developed at Werribee are described. Field trials include accurate fertilizer tests, discovery of residual fertilizer effects, superphosphate tests on normal fallowed land, gypsum trials and minor elements tests. Similar procedure is followed with respect to oats and barley and trial data are presented in each case.

Crop rotation experiments have been conducted for more than 30 years and so far the most successful rotations are fallow/hay; fallow/hay/barley; fallow/wheat/pasture; fallow/wheat/oats/pasture. Under local conditions peas do not provide a satisfactory substitute for bare fallow. The possibilities of using green manures to maintain organic matter in the soil and at the same time provide an economically sound cropping system are being investigated. Other problems receiving attention are the control of *Lepidium draba*, growth of field peas and use of selective weedicides.—M.E.E.

EMPIRE COTTON GROWING CORPORATION. Progress reports from experiment stations, season 1946-1947. Programmes of experiments season 1947-1948. 1948. pp. 152. **1357**

Regional Experimental Station, Biloela (*Queensland*)

The 1946-47 season was one of the worst experienced at the station. Weather conditions were most unfavourable and there was an extraordinary outbreak of the web caterpillar. There was considerable damage to the cotton crop and no experiments dealing with agricultural practices are reported. The time and rate of spray irrigation experiment conducted in the previous season was repeated and trials were undertaken on the major commercial varieties suitable for the district, following three cropping rotations. In the irrigation experiment the total yields for the season indicated that the two treatments which received their second watering of 3 in. 48 days after a similar pre-planting watering and then further 3-in. waterings in the first and third weeks of January, out-yielded all others.

Cotton Experiment Station, Barberton (*S. Africa*)

From the breeder's point of view the 1946-47 was one of the best experienced during the past 20 years. Conditions were generally good apart from a heavy attack of American bollworm, followed by a moderate drought. The bollworm attack and the drought were nevertheless useful as they enabled records to be obtained on the powers of recovery from both bollworm and drought exhibited by the latest hybrid selections.

Twenty-nine of the most promising strains derived from U.4/8161 × Sea Island, U.4/8161 × Egyptian, M.U.8 × Tidewater and M.U.8 × BP.52 will be included in the 1947-48 variety tests along with the Station's best *hirsutum* strains, in order to get an accurate comparison of their yields.

Cotton Research Station, Gatooma (*Southern Rhodesia*)

The drought-tolerant qualities of the cotton crop as compared with maize were once again emphasized during the drought conditions which dominated the whole of the 1946-47 season. The yield returns from the main variety trial confirmed those of the previous season, that derivatives of the 7Cs (Gatooma U4 × Cambodia) × U4 are as good as, or possibly better than 9L34, the strain at present in commercial cultivation and a descendant of the original U4 material.

The Gezira Station (*Anglo-Egyptian Sudan*)

No significant difference was noted in the variety trials to determine whether or not the Domain's Sakel Selections 1 and 2 were at least up to the parent Domain Sakel bulk in yield. Provided spinning tests and market reports upheld the slightly superior grade and quality of D.S.1 there appeared to be no reason at the time of the report why it should not replace the present parent commercial strain. Strains of X.1730 A grown in Gash were identical in germination, growth and yield to those grown in Tokar. It is suggested that, provided hair and spinning tests are also identical, Tokar should replace Gash as the X.1730 A seed area. BAR 1730L has been found to be a satisfactory blackarm resistant substitute for X.1730 A.

Shambat Station (*Anglo-Egyptian Sudan*)

The direct application of genetics to plant breeding remains the basic work of this Station

Kadugli Station (*Anglo-Egyptian Sudan*)

Excellent stands of all crops were obtained and the early promise of record yields was fulfilled. The main variety trial returned a record yield of 2098 lb. seed cotton per acre (654 lb. lint) from an overall area of 1.3 acres. The merits of close intra-row spacing (45 cms.) have been demonstrated for the 1946-47 season. A discussion on the relative merits of "upright" versus "runner" habit in groundnuts is included.

The main variety trial for the 1947-48 season is five strains × two spacings × five replications BAR.SP.84, BAR.NT. 205/45, BAR.NT. 205/43 BAR.NT.96/40 and Pump Scheme Strains.

Kawanda Cotton Experiment Station (*Uganda*)

District variety trials were conducted at 11 centres in Buganda during the 1946-47 season. The individual 5 × 5 latin squares were analysed separately and collectively as a serial experiment The difference between the localities were very significant, especially so in the variety × locality interaction. Certain varieties which yield well at high fertility levels yield poorly at low levels of fertility. This information would suggest the general direction towards which the breeding policy the major Experiment Stations should be aimed.

vere Cotton Experiment Station (*Uganda*)

Breeding work during recent years has en confined largely to strain testing of various ections from the three standard varieties N. 17, 181, and BP. 50. Separate variety trials in-cate that for the N. 17 group certain selections, tably S. 4101, S. 4106 and S. 4108, had fewer ackarm lesions per plant and in addition gave gher yields of seed cotton than the N. 17 standard. hile the cropping capacity during the 1946-47 ason of S. 4108 was outstanding in this group, ere was some evidence, itself inconclusive, that e mean lint length was shorter than N. 17.

kirigura and Lubaga Experiment Stations *anganyika*)

In a year of exceptionally heavy rains cotton ffered from jassid, blackarm and in places, water gging. Better jassid-resistance was doubtless e main reason for the superiority of the new rain mixture, U.K. 46, over the commercial Z. 561 which it is to replace. U.K. 46 outyielded Z. 561 by an average of 25 per cent in 17 trials roughout the cotton belt. The provisional con-usion of 1945-46, that at Ukirigura, on light land, e benefits from a three year's grass rest had been ssipated, needs modification in the light of the gnificant benefit which appeared in the third year.

onga Station (*Tanganyika*)

The variety trial of the previous three seasons as planted again with Eastern Province local; ganda B.P. 52; Mwanza 561; B 38/9, a selec-on from Eastern Province Local and M.U. 8A, selection from Malwa Upland.

omira Bay Station (*Nyasaland*)

The possible advantages of an early start to e rains were nullified by continuously wet and nless weather and it is probable that the crops ffered from nitrogen starvation. The relatively od return from groundnuts compared with the or yield of cotton and even poorer yield of maize e suggestive. Mixed cropping of cotton and aize gave inconclusive results but more investiga-on is justified. Trials show that the present mmercial bulk cotton is still capable of good elds and satisfactory lint quality.

orthern Provinces (*Nigeria*)

Strain Samura 26c was multiplied up at Dandawa and was distributed to farmers for the first time in 1947. Variety trials were carried out but no significant differences were obtained.

Western Provinces (*Nigeria*)

Botanical work at Ibadan followed the same programme of selection and multiplication of Ishan as in previous years but was rendered extremely difficult through failure of the normal rains.

Antigua Station (*West Indies*)

This is the first report from the Cotton Station and notes are given outlining the agricultural conditions in relation to the cotton crop. Little is known of the requirements of the soils for cotton growing and the crop is typically unmanured. For this reason a series of factorial experiments using three levels of N.P.K. were laid out on the station and on other representative cotton soils. The conditions under which the crop was produced tended to level out treatment difference and little reliance is placed on the yield results. In growth, as measured by plant weight, there was definite increase from nitrogen applications.

A combined spacing cultivation and fertilizer experiment gave the following results:

(a) early growth increase and significantly higher yields from the fertilized plots; (b) high significant effect of spacing; the closer spacings showed little difference but were all significantly higher yielding than the widest which was one plant at 36 in.; (c) no difference in growth or yield between ridge and flat cultivation; (d) no interactions between treatments were shown.

Trials were laid down to test rotations which might meet the demand for intensification of production and the maintenance of soil fertility. Rotation Trial A has the following treatments (1) three crops of cane-plant and two ratoons; (2) elephant grass for the same period; and (3) two cotton crops followed by a complete year in green manure. Rotation Trial B—a comparison of the various means of handling the land during the period between the end of the reaping and the next planting—(1) a short-term food crop, either maize or pulse; (2) a green manure crop; (3) bare fallow; and (4) the common practice of weed fallow.—G.M.H.

NON-CURRENT LITERATURE

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Zanini, E. Primi risultati agronomici del colonizzamento del latifondo siciliano. [**First agronomical results of colonization of the Sicilian large landed estates.**] *Atti. Accad. Georgof. Firenze* pp. 27. 1943. [Received 1948] **1360**

Mancini, E. Il contributo italiano al progresso dell' agricoltura, negli ultimi cento anni. [**The Italian contribution to agricultural progress, in the last hundred years.**] *Un secolo di progr. sci. Ital.* 1839-1939. 231-59. 1939. [Received 1948] **1361**

Bergamo, Stazione Sperimentale di Maiscoltura. Opusc. No. 20. Piante alimentari. Il granoturco. [**Food plants. Maize.**] By *T. V. Zapparoli. Ital. agric.* **73**. pp. 12. 1936. [Received 1948] **1362**

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NEWS ITEMS AND SCIENTIFIC NOTES

Great Britain

New British Crawler Tractor **1400**

Since the beginning of the war the British farmer, says the National Farmers' Union, had had to rely on American crawler tractors and with the end of lend-lease the import programme for crawlers has been far short of the demand. Therefore the introduction by Marshall Sons and Company, of Gainsborough, Lincoln, of the new all-British Marshall-Fowler track-laying tractor is a matter of great importance. The National Farmers' Union, through its Machinery Committee, has worked closely with Marshall and Sons in putting a prototype of the commercial model under extensive trials on the farm. The reports indicate that this tractor should substantially fulfil the work required of it and, if this proves to be the case, the main concern will then be the production capacity of the company. On the 29th April, there was an open demonstration at the farm of H. Anderson and Sons, Meadow Lane, St. Ives, Huntingdonshire. The main features of interest include : single cylinder two-stroke diesel engine (this means fuel economy) ; simplicity of design ; sturdy construction for exceptionally long working life ; smooth steering to give easy control ; heavy duty gear box (six forward, two reverse speeds) for wide power range and exclusive track stabiliser to ensure exact alignment of tracks at all times. *London Corn Circ.* May, 1948.—G.M.H.

Europe

Agricultural Mechanization **1401**

In all European reconstruction programmes agricultural machinery is ranked among priority goods, and the tractor is considered as the most suitable means of speeding up production. Tractors are now used much more extensively in Europe than previously, numbering almost half a million, compared with about 270,000 prior to the war. This increase, however, is not sufficient to cover the losses of draught animals suffered during the same period ; these losses are calculated at 5 million horses and mules, which are now estimated at approximately 13 million.

The need for tractors is urgent, particularly in cou
tries where the shortage of farm workers is becoming eve
more acute. The industrial recovery attracts manpowe
away from the country and the workers who remain sho
a rising preference for motorized work. Once the worke
have become familiar with motors, they have no wish
return to the more laborious work with draught animal
Comparison shows that the United Kingdom and Franc
to-day possess as many tractors as the rest of Europ
together (200,000 in U.K. and about 50,000 in France
F. A. O. Bull. June-July, 1948.—G.M.H.

Belgium

Sugar beet Research **140**

The Belgian Institute for beet improvement ha
extended research work on all aspects of beet growin
Particular attention has been given to the single-seede
glomerule and its merits and disadvantages have bee
determined. Further investigations need to be carrie
out in order to ascertain whether the use of the singl
seeded glomerule will reduce labour at the time of spaci
and singling. The fertilizer value of sodium has also bee
studied. Encouraging results in nematode control ha
been obtained by means of a suitable rotation according
the known extent of infection, and disinfection of the s
by volatile fumigants. In testing out new insecticides,
1947 an invasion of the beet fly in Belgium was co
pletely arrested. Mention may also be made of other be
improvement work effected by the Institute : the use
hexachlorocyclohexane products for the control of t
pigmy mangold beetle (*Atomaria linearis*), the creation
polyploid types, genealogical selection of the beet with t
two-fold objective of creating a variety adapted to Belgi
ecological conditions, and of gradually making Belgiu
independent of imported beet seed, at present amounti
to one million kg. to the value of 30 million Belgian fran
(From " Le Sillon belge," No. 297, 28 March, 1948, p. 1
F. A. O. Bull. June-July, 1948.—G.M.H.

France

Rice growing 1403

Rice cultivation was introduced into France before the First World War. Rice-fields were laid out in Camargue where irrigation facilities were more easily obtainable. The cessation of rice imports from the Far East during the German occupation gave fresh impetus to rice-growing, which extended to other Mediterranean zones where climatic conditions are suitable. The chief rice-producing Departments are Bouches du Rhône, Gard, Aude, Var, Vaucluse and Hérault. The following figures indicate the increase in production and in area cultivated since 1943 :

1943-44	5000 qls. from 460 ha.
1944-45	5000 qls. from 500 ha.
1945-46	8000 qls. from 500 ha.
1946-47	13,140 qls. from 762 ha.

In the 1947-48 season 1700 ha. will be grown to rice, and the expected yield is calculated at 40,000 qls. It is considered that with the use of tractors and mechanical means, home production of rice could attain 200,000 qls. per annum. *Food Agric.* April-May, 1948.—G.M.H.

Italy

Rice growing 1404

In Italy, the National Economic Committee is of the opinion that rice cultivation should be extended to the maximum technical limit, namely, to about 150,000 ha. Increased production is considered essential in order to meet home requirements and to renew the export trade in rice. *Food Agric.* April-May, 1948.—G.M.H.

Flax 1405

In 1947, the Italian flax crop amounted to 200,000 quintals of stems. Only 4500 ha. were grown to flax, considerably below the average of 8000 ha.

The bast represents 10 to 12 per cent of the total weight. The yield in fibre may be calculated at 400 to 500 kg. National requirements in flax fibre amount to approximately 3000 quintals.

Flax cultivation is being encouraged in Italy and flax-seed is being sought from the Netherlands and Belgium in order to improve the quality of Italian flax, as although the plants are hardy, the fibre is mediocre. Flax pests will be controlled with DDT. *F. A. O. Bull.* June-July, 1948.—G.M.H.

Hungary

Rice growing 1406

Approximately 5755 ha. are under rice in Hungary and the yield attains 18,000 tons. This should suffice to meet the requirements of the country. Before the war practically no rice was cultivated and some 20,000 tons were imported annually from Italy. It is expected that the 1948 crop will almost cover home consumption. *Food Agric.* April-May, 1948.—G.M.H.

U.S.S.R.

Mechanization 1407

On the eve of the Second World War, there were 7000 farm machinery and tractor centres to serve the kolkhozy in the USSR. With these tractors and machines 111 million ha. were cultivated, saving the labour of 11 million persons per year. USSR now has about 7600 agricultural machine and tractor centres, and according to the Soviet press, these will be increased to 8400 in 1950, which will enable the greater part of farm operations to be mechanized (90 per cent ploughing, 70 per cent sowing and 55 per cent harvesting). *Food Agric.* April-May, 1948.—G.M.H.

Flax 1408

Compared with last year (1947) the area under flax in Russia has increased by 21 per cent.

According to the five-year plan for the reconstruction and expansion of Soviet economy the total flax fibre crop for the period 1946-1950 will be raised to 800,000 metric tons in the next two or three years. All planting will be done with high grade seed and all cultivation and preliminary treatment of the flax will be mechanized. *F. A. O. Bull.* June-July, 1948.—G.M.H.

Harvest prospects 1409

The regions along the Volga are suffering from drought and very great heat. It is believed that the cereal harvest, particularly spring wheat, will be so small that agriculture will not be in a position to fulfil its obligations to the State. The provinces of Kubsk and Tambov in the glack earth district are also suffering from drought, as no rain has fallen since May, and the weather has been unusually warm. The prospects of a good harvest have thus deteriorated in these regions also. The harvest prospects for the other regions of the Union are hitherto good. For the Union as a whole the area sown with spring wheat this year is 5.3 million hectares larger than in 1947. *Landbrugsraadets Medd.* 8 July, 1948. —R.P.J.

Africa

Appointment 1410

Professor John Phillips, of the University of the Witwatersrand, has been appointed Director of Agriculture to the Overseas Food Corporation. He will not be able to take up his duties for six months, but visited the groundnut areas in East Africa in July. *Crown Colonist.* July, 1948.—G.M.H.

Egyptian Agriculture 1411

In the course of his speech, at the 48th annual general meeting of the National Bank of Egypt, held in Cairo, the President, Aly Shamny Pasha, said : —" Egypt, in spite of her numerous difficulties, remains a relatively prosperous country. Egyptian agriculture continues to feel the effects of the regulations introduced by the State in 1941. These measures, taken at a time of a deficit in the wheat crop, still exists with all their restrictions. We are still under a regime of limitation in the rotation of crops and of compulsory delivery of cereals, not to mention the rationing of chemical fertilizers which has resulted in a decline in the yield of food crops. Consequently, the production of wheat, which amounted to nearly 9,000,000 ardebs† in 1939, when the cultivated area was 1,450,000 feddans* and even then did not entirely cover the country's needs, fell to 7,000,000 ardebs in 1947, despite the increase in the area up to 1,630,000 feddans. The yield, which was 6.15 ardebs per feddan, declined to 4.27 ardebs in 1947. The same may be said of maize, which from a crop of almost 11,000,000 ardebs in 1939 fell to 10,000,000 ardebs in 1947, although the cultivated area had appreciably increased. Fortunately the production of rice and millet shows a marked rise by comparison with pre-war, thanks to increases in the cultivated area of 40 per cent and 30 per cent respectively. Our surplus rice production now serves us as a medium of exchange for some imports of wheat and maize. The fact remains that to meet the world shortage of foodstuffs, it was necessary to resort to the sowing of one grain crop after another, but this system has caused impoverishment of the soil, and only by a progressive return to a more liberal agricultural policy and normal crop rotation, when that becomes possible, will equilibrium be restored. A greater supply of chemical fertilizers as well as gradual renewal of our agricultural machinery will not fail to contribute to the revival of our farming. But there will still be Egypt's burning problem, the constant increase in her population (20 per cent in 10 years) compared with the extent of cultivated land."

†1 ardeb = 5.44 bushels (measure). 1 ardeb of wheat is reckoned to be 150 kg., and 1 ardeb of maize 140 kg. (1 kilogramme = 2.05 lbs.) *1 feddan = 1.038 acres. *London Corn Circ.* May 10, 1948.—G.M.H.

East Africa

The Groundnut Scheme 1412

In March 1946, the Managing Director of the United Africa Company presented a scheme to the British Government in which he proposed the mechanized production of groundnuts in East Africa as a contribution to the relief of the present critical world shortage of oils and fats. The scheme proved to be of sufficient interest to warrant setting up a mission of investigation in June. The mission acted speedily and presented a report by the end of September which so interested the Government that it decided in the November to start work on what was to be known as the East African Groundnut Scheme. It has been estimated that the scheme will be capable of reducing Britain's fat shortage by at least one-third by the end of the Marshall Aid Period. Execution of the initial stages of the plan was entrusted to the United Africa Company which has had considerable experience in colonial agricultural development. The Overseas Food Corporation, under State control, has now taken over the development phase.

The scheme calls for the clearing of over 3 million acres of virgin forest and bush in Tanganyika Territory, Northern Rhodesia and Kenya comprising some 107 units, each of 30,000 acres. The biggest developments are to take place in Tanganyika and here it is planned to clear 80 units. The units are located in three different districts in the Territory—(a) 10 units in a western area around Tabora; (b) 15 units in the thorn scrub around Kongwa; and (c) 55 units in the semi-coastal belt of the Southern Province. Taking the port of Dar-Es-Salaam as base, the first area is over 500 miles to the WNW, the second is over 200 miles to the WNW and the third is about 250 miles to the SSW.

The blocks are in sparsely inhabited parts of the country, much of it completely uninhabited. It is hoped that this will minimise the disturbing influence on the African population but it has meant an initial shortage of labour. The almost total absence of native artisans in East Africa and little or no tradition of craftsmanship has not in any way eased this labour problem. In addition, the majority of the blocks are ridden by tsetse fly, lacking in surface water and to a very large extent, completely unexplored. The areas have never been mapped with accuracy and only the most meagre rainfall and other climatic records existed though it is known that the degree of rainfall reliability is uncertain. Soil types vary considerably from black cotton soils to the lightest and most friable types—the latter so friable that the danger of both wind and water erosion is immense. Tenuous communications are also a serious handicap to development.

The oil-producing groundnut (*Arachis hypogaea*) that is to be in the immediate forefront of this general food production drive, is a native of South America but is cultivated widely in West and South Africa, India, the Far East and North and South America. It can be grown as an annual crop in most tropical and subtropical countries, its main requirements reportedly being a light, sandy, well-drained soil, a hot climate with well-defined wet and dry seasons and a rainfall of 25 to 40 in. Its growing season is about 100 to 140 days. The nuts have a high oil value of about 45 per cent and by cold expression of the kernels a yield of 40 per cent oil is obtained. The edible grades are largely used in the manufacture of margarine, peanut butter, cooking and salad oils; the inedible grades are used chiefly by the soap manufacturer. An analysis of two of the varieties, Virginia Bunch and Spanish reveals a protein content of 29.5 and 31.2 per cent respectively, thus the residual press-cake left after the extraction of the oil from the kernels forms a valuable cattle food with about 47 per cent protein in the decorticated cake and 30 per cent in the undecorticated cake, as well as approximately 6 per cent oil. It has been suggested also that in future a certain amount of this residual press cake might be used for the manufacture of artificial wool fibre known as Ardil.

The original intention was to start clearing work in the Southern Province of Tanganyika but this was later changed to the Kongwa thorn scrub area. The change has since been criticized because even though to the inexperienced eye there appeared to be fewer trees and only bush to be cleared in the Kongwa district, the bush with its pliable roots and myriad stumps is more difficult to clear quickly than would have been the case in the Southern Province where there are a number of actual trees to each acre.

Several operations have been involved in the clearing work to date, the cutting of traces through the bush, the flattening of the bush, the burning of the debris, windrowing, the felling of the larger trees and the extraction of the roots. It has been necessary to develop a technique adapted to the conditions on the spot for each of these operations. The extensive tough and pliable roots of the Kongwa thorns and the multiplicity of stumps proved to be beyond the power of normal rooting machines but now after many weeks of experiment a method of de-rooting with modifications of equipment has been evolved. Unfortunately this method was found too late in the season to plant more than some 8000—10,000 acres this year.

The first operation in virgin bush is to bulldoze those trees and shrubs whose root systems come away cleanly. Standing trees are then cleared by angle-dozers, tree dozers and winches. Baobab trees have frequently proved difficult and many have been left standing for future consideration. Before the bush is moved levels are taken and contours marked at 9-foot intervals. Some of the wood is burned, the remainder is bulldozed into windrows along the contours. Soil erosion is the curse of the country and the danger of creating a " dust bowl " on the American style is being averted by this contouring.

Root clearance follows, then disk harrowing and combine planting with 4-row 28 in. Massey-Harris machines. The nuts are shelled mechanically and planted 3.5 in. apart (low germination caused the distance to be reduced from the original 6 in. apart)—not in straight rows, but in lines along the contours to prevent swift heavy downpours from washing away all the soil. All clearing and agricultural operations at Kongwa have been carried out with the primary aim of preventing erosion and this is probably the first instance in any country of comprehensive soil and water conservation measures being applied to a whole region from virgin bush up to and throughout cultivation.

Harvest time comes four to six months after planting. The nuts are first lifted out of the ground mechanically then left for 7 to 10 days to dry. Four or six rows are then windrowed into one, after which the combine harvester is used.

A simple variation of half groundnuts and half grass is to be followed at first but whether this will be on the basis of one or two years of groundnuts has yet to be decided. A whole series of experiments designed to test the value of various rotations are underway, including one or two years in groundnuts with one or two years in sorghum or millet. Many plants such as sunflower and cowpea are being tried as alternative crops and already quite unexpected success has been achieved. It may be found that sunflowers—of which several varieties have been planted and are flourishing—will give even more valuable returns than groundnuts. The sunflower gives a slightly lower content of oil, but on certain soils it might give a better tonnage than groundnuts. It also has the advantage of giving more organic matter to plough back into the soil. There are no fewer than 42 other types of crops in 146 different varieties already being tried.

Criticism has been made of the fact that the crops concerned are mainly extractive but to counteract this fertilizers are being used to maintain and improve the nutrient value of the soil. Where tests indicate it to be necessary, 4 cwt. of lime is applied per acre and 1 cwt. of superphosphate and 0.5 cwt. of sulphate of ammonia direct to the groundnuts themselves (near to, but not in contact with the seed). A large number of fertilizer experiments have been laid down and it is hoped that smaller dressings will be equally effective. It is also planned to utilize local phosphate deposits and the local manufacture of calcined phosphate.

To counteract pests it was thought that close planting, both within and between the rows and the absence of clean weeding were necessary to produce the humid micro-climate considered inimical to the aphis vector. Experience on the Springbok Flats in South Africa has shown however that there should be close planting within the row to enable the predator ladybird to move freely from plant to plant in search of the aphis fly which transmits the rosette disease. Wide spacing is then permissible between the rows, and this of course, will facilitate mechanical cultivation. Seed is being dusted to prevent a higher incidence of rosette disease and the countryside is being dusted with gigantic machines and helicopters. Unfortunately this latter treatment is being done before the effect of such treatment on the delicate balance of the living organisms of the soil is understood—a balance on which the fertility of the soil largely depends.

The machines used for the various clearing and cultivation processes were in the first instance nearly all secondhand American Army stock and were far fewer in number than was originally expected. The natives are on the whole intelligent and learn a trade or occupation at a reasonable speed but they are neverthless hard on machinery and though technical schools have been started there is considerable leeway to be made up. A full fleet of bulldozers a d heavy equipment are now available. Without the acquisition of this tractor fleet, further progress on the scheme would have been delayed.

Besides clearing the bush and planting and reaping the nuts, hundreds of miles of roads and railways, a new deep water harbour, storage depots and other installations have to be built before nuts on a worth-while scale can be exported to England. Thus, though primarily a vast agricultural undertaking, the scheme is also during its development stage, a vast engineering project. It implies the construction of a minimum of 150 miles of railways, either in spurs off the main central line or the main line, to open up the Southern Province, a new port with deep water berths and facilities for bulk handling, thousands of miles of new roads and accommodation for about 2000 Europeans and and 60,000 to 70,000 Africans. It implies the construction of port installations, storage depots, hospitals, workshops and agricultural installations on a large scale. It is unfortunate in this connection that there is no industrial potential in East Africa to cope with the immense demands that are now being made by the scheme.

A small technical mission which visited Tanganyika in February 1947 recommended building the new port at Mikindani, south of Lindi. Work has begun on the construction of this port and the 120-mile long railway line connecting it with the development area inland in the Southern Province. The first berths are expected to be completed by the end of 1948. In opposition to this port it has been said that lighterage ports are much cheaper and quite as efficient as the type now under construction. In so far as 80 per cent of the Mikindani traffic will probably be bulk export it has been said that a cheap "fit-up" scheme is indicated by the present material and labour shortage and the dictates of economy in public money. Meanwhile, at Dar-Es-Salaam, owing to the increase in its normal traffic coinciding with the arrival of large supplies for the scheme, there has been serious congestion. Special arrangements have been made to ensure that the capacity of the port is used to the maximum possible extent but the present limited port facilities and the consequent danger of congestion will, however remain a serious problem.

Surface conservation in reservoirs, or the location of and drilling for underground supplies are the only methods of obtaining adequate water supplies in the groundnut areas. There is no surface water available, but certain supplies from surface deposits may often be found by drilling in the centres of " mgubas" (old drainage channels). The best results have been obtained from fissures in the crystalline rocks of the Lower Basement Complex which have been located by geophysical methods. Water has been struck in such fissures at depths varying from 100 to 200 ft. and the yield has been in the order of 2000 gal. per hour per well.

Besides the numerous physical problems involved in this great undertaking there is a large human problem. In this part of Africa, the natives have been in contact with Europeans far less than in other parts and in the development areas of the Southern Province it is said that conditions of life and society there are much as they have been since time immemorial. The natives have now had thrust upon them suddenly an invasion of " new" Europeans ; the " new" Europeans do not know Swahili and the " old" Africans do not know English.

The scheme will most certainly bring its attendant opportunities for material advancement by the natives and the proposed medical welfare and educational services will be of great value. But the fear has been expressed that the tribal society will inevitably be destroyed in the process together with the traditional basis of what was good in personal conduct and community relationships.

At present good wages and good food have proved sufficient inducement to the natives but if the number is to be increased to the 50,000 mentioned in the White Paper the scheme will inevitably complete with established industries like the sisal plants, or the new lead mines at Mpanda. Raising wages is of no use for the maintenance of the necessary labour force since the African of these parts has even fewer wants than those eleswhere. If he is paid a great deal he will merely work for an even shorter period than he does. There is no question of the African being forced to work because this is contrary to the policy of the British Government.

With the development of the scheme it is expected that the local African population will continue to increase. Thus more and more of the extra food that Africa produces will be consumed on the spot. Should local food supplies remain as they are at present a critical position would undoubtedly be reached but the scheme is expected to be developed to produce large quantities of cereals for local consumption in addition to the groundnuts. In time oil mills are to be established locally and the nut residues of high protein content will be available for human consumption. Further " the progressive health, nutrition, housing, welfare, and labour policies that will be integral parts of the scheme will not only raise the standard of life of the undertaking's employees and their families, the increased national income and revenue from taxation will also make possible higher standards of living and better social services throughout the territories."

On the future organization of the scheme it has been suggested that the land be parcelled out on long lease " to approved individuals, farming companies or African co-operative associations " with the Corporation remaining to carry out research, demonstrations, create and enforce rules about cropping. On this point the original mission reported that " serious objections would be raised to the concession of private rights over such a vast tract of Africa as 3,210,000 acres" and that " it would therefore seem desirable to provide from the outset for the ultimate taking over of the project, possibly in stages, first by the African Governments and subsequently by the peoples of the territories themselves " and that " the second transfer of ownership, namely, from the local Government to the peoples of the territories concerned, is one entirely for local decision."

The groundnut scheme is the first real attempt at tackling the tremendous problem of the ruinous methods of production in African agriculture and it is to be hoped that it will bring substantial and lasting benefit to the local economy and a better standard of life. It has been estimated that in terms of groundnuts alone the scheme will enable Tanganyika to double its present exports and of course, its further possibilities are incalculable. Whereas the East African peasant farmer with his present methods of cultivation can produce on an average about 4 cwts. of groundnuts a year in addition to subsistence crops for himself and his family, each labourer on the Kongwa section of the groundnut scheme can produce his own subsistence crops and 25 tons of groundnuts. One can hardly doubt the importance of this project when this measure of progress is applied to African food production in general. (From white papers, articles, reports, and correspondence dealing with the East African Groundnut Scheme).—G.M.H.

West Africa

Groundnut Production 1418

Answering a question in the House of Commons recently, on groundnut production in the West African Colonies, Mr. Creech Jones, Colonial Secretary, said that the season's crop of groundnuts in Northern Nigeria was again a bumper one of 313,000 tons. We should also get 50,000 tons from the Gambia, he stated. No difficulty was being met in moving the Gambia crop, but accumulated stocks of groundnuts in Nigeria on 20th May amounted to nearly 280,000 tons. At the peak of the season—at the end of March—there were over 303,000 tons.—*London Corn Circ.* June 14th, 1948.—G.M.H.

Northern Rhodesia

Survey **1414**

Dr. H. Bunting, the Chief Scientific Officer of the Overseas Food Corporation, is to make a preliminary survey in the Mumbwa area of Northern Rhodesia where large-scale groundnut and maize cultivation is projected.—*Crown Colonist.* Aug., 1948.—G.M.H.

South Africa

New Experiment Station **1415**

A 500-acre farm near Pietermaritzburg, to cost £35,000, has been acquired by the Government for use by the Agricultural Research Institute as an experiment station and for practical instruction of students in the Faculty of Agriculture, Natal University College. *Fmr's Wkly, Bloemfontein.* June, 1948.—G.M.H.

Cotton Research **1416**

The cotton research station at Barberton, which has been maintained by the Empire Cotton Growing Corporation for the past 20 years, will be taken over by the Union Department of Agriculture next year.

It will continue to function as a cotton research station, but will probably handle other types of crops also.—*Fmr's Wkly, Bloemfontein.* June 30, 1948.—G.M.H.

Sunflowers and groundnuts **1417**

Sunflowers are not likely to be grown in the Union again on such a large scale as during the past season. Mr. J. Sellschop, of the College of Agriculture, Potchefstroom, states that there are many indications that farmers will plant less of the crop next year and many will give it up altogether in favour of groundnuts. This year's crop is a record one of about 1,000,000 bags. It has been suggested that the development of the attractive dwarf varieties, Mars and Jupiter in England, would lead to an increase in sunflower plantings. The difficulty about sunflower seed is that the chief demand is for oil, and groundnuts offer considerable advantages as an oil seed crop in the Western and Northern Transvaal, where the record sunflower crop has chiefly been grown. Groundnut hay is as good as lucerne and stock eat it all. Sunflower hay is less nutritious ; stock leave the stalks, which foul the ground and harbour disease for coming crops. Groundnuts are highly resistant to eelworm. Sunflowers seldom show ill effects from it, but their roots often foster it, infesting the ground still more for eelworm-susceptible crops. This seems to be the chief truth behind the general illusion that sunflowers are a peculiarly soil exhausting crop.

For the oil-expresser groundnuts have advantages over sunflower seed. Sunflower seeds have to be decorticated on the spot, causing difficulties in the disposal of the husks.—*Fmr's Wkly, Bloemfontein.* June 9, 1948. —G.M.H.

Mauritius

Fibre Industry **1418**

The investigation into the fibre industry by an official from Tanganyika has resulted in the conclusion that the industry should be capable of development, preferably on the basis of small units until the problem of finding better means of decorticating the leaf is solved. The investigator is of the opinion that Mauritius hemp is not suitable for export in its present form, but is suitable for making bags for the sugar industry, and that the goal of producing all the bags required for a crop of 300,000 tons should not be unattainable.—*Crown Colonist.* July, 1948.—G.M.H.

India

Oil Crops **1419**

Out of a total of 50,000 tons of groundnuts from India to be distributed among sundry importing countries, the United Kingdom has been allocated 29,000 tons, and from 30,000 tons of nut oil our quota is 4500 tons. Of castor seed, out of 21,500 tons to be exported, 7000 tons is reported to have been allocated to the United Kingdom.—*London Corn Circ.* April, 1948.—G.M.H.

Taiwan (Formosa)

Development of agriculture **1420**

Endowed with a warm climate and fertile soil, Taiwan reaps three good harvests annually but until quite recently cultivation was carried out without the aid of machinery. In order to boost production the Taiwan Provisional Government in association with the CNRRA and UNRRA Taiwan Regional Offices introduced in August, 1947 "a Committee for the Mechanization of Agriculture and Reclamation." Forty tractors were provided by CNRRA to be operated in Kaohsiung, Tainan, Taichung and Hualian. These tractors were divided into four teams to be stationed at these centres and the service was launched in October, 1947. In the beginning farmers were able to apply for the use of these tractors free of charge so that they might be convinced of the efficiency of machinery. Interest was stimulated and the farmers soon realized that mechanical power was some 50 times higher than man power. This brought about an increased demand for the tractor service from both private and public farms. To meet the growing demand the committee has planned to acquire an additional 20 tractors and 5 harvest machines. A charge for the use of the machinery will be made at 80 per cent of the costs of man or animal power.

In addition to the shortage of animal draft power, Taiwan is also short of fertilizers. The farmers have been accustomed to the use of chemical fertilizers, which is greatly needed for sugar cane production. Fortunately, since V.J. Day, 150,000 tons of fertilizers supplied by UNRRA and 110,000 tons handed over by the Japs, have been used to help growing the staple agricultural products, such as rice, sugar cane, potato and tea, covering an area of over 800,000 ha.

For the increased production of sugar cane, tea and fruits, approximately 200,000 tons of fertilizers are needed. Besides the carried over stock of 30,000 tons, the Government has promised to grant 99,000 tons to Taiwan out of 140,000 tons of fertilizers allotted by FAO to China. In addition, the Taiwan Sugar Corporation is to purchase 300,000 tons of fertilizers direct from the United States. Now that agricultural tools, machinery and fertilizers are available there are good prospects of an increased output from Taiwan agriculture to help relieve the stringent situation of the rural economy in the island.—*Monthly Agric. News Bull. Dept. Econ. Res., Farmers' Bank of China.* Feb., 1948.—G.M.H.

Australia

Coarse Grains 1421

The Overseas Food Corporation and the Queensland Government have agreed to a scheme for the cultivation of coarse grains and later, probably, sunflowers, on some 300,000 acres of grassland in Queensland. The coarse grains will be used for animal feeds, in particular pig feed, partly in Britain and partly in Australia. The sunflower seed will be used to produce edible oils for the manufacture of margarine and other oil products. *Fmr's Wky, Bloemfontein.* May, 1948.—G.M.H.

Performance of Wheats 1422

Dr. Kent-Jones, British world authority on wheat, flour and baking problems, who visited Australia in 1947 to investigate local problems, has now submitted an interesting report on the quality of some of the wheats that gained prizes at the Sydney Royal Agricultural Show that year. After analysing these wheats and determining the stability and strength of their flour, Dr. Kent-Jones said that some of them were better than top-grade Manitoba wheat. Cailloux, Charter, Yalta and Gabo were found to be exceptionally strong wheats, with well-balanced doughs. In English blends these wheats, said Dr. Kent-Jones, would be more useful than top-grade Manitoba and would carry weaker wheats better than the Canadian types.

He said that all samples were of exceptionally good appearance, and that New South Wales was to be congratulated on being able to produce wheats of this type regularly and in quantity. In Australia, bakers were pleased with the quality of flour being milled from Gabo, a variety bred by Professor W. L. Waterhouse, of Sydney University.

A small quantity of flour, milled from Gabo grown in the Forbes (central New South Wales) district, was used to produce bread for show purposes. In open competition, the Gabo bread gained a State championship, two first, nine second and seven third prizes. Gabo had never previously been baked commercially, and this was the first time on record that flour from a single wheat had been used to produce bread for show purposes. *London Corn Circ.* May, 1948.—G.M.H.

Canada

Cereal and Flaxseed Acreages 1423

The Dominion Bureau of Statistics Agricultural Division, Ottawa issued a report on acreage intentions for 1948 field crops on May 13. The report included the following information.

Wheat : Canadian farmers have indicated on the basis of their intentions at April 30, that they will seed over half a million fewer acres to wheat in 1948 than they did in 1947 (23.7 million acres as compared with 24.3 million acres in 1947).

Oats : Acreage is expected to be up some 722,000 acres (11.8 million acres compared with 11.0 million in 1947)—an increase of 7 per cent.

Barley : Intended acreage for the whole of Canada is estimated at 7.4 million acres as compared with 7.5 million acres in 1947.

Flaxseed : The intended 1948 flaxseed acreage of 1.7 million acres represents an increase of 8 per cent above the 1947 level.

Rye : The area of autumn rye for harvest in 1948 is placed at 1,162,000 acres, an increase of 38 per cent of the 1947 harvested acreage. Spring rye seeding intentions are also up 21 per cent from the 1947 level. For all rye the indicated acreage is 1,542,000 acres or an increase of 33 per cent over 1947.—G.M.H.

South America

Crop Production 1424

A message to the Bank of London and South America from Buenos Aires, dated 23rd April contains the following information: " The recent wheat crop in Argentina surpassed all local records, and it is claimed that no country has produced finer wheat during the past 20 years ; the weight of the grain in many cases was as much as 64 lb. a bu., whilst the total yield is privately estimated at 7,000,000 metric tons, giving an exportable surplus of about 3,500,000 tons. The linseed crop is unofficially calculated at 700,000 tons which is well below the average, but this product is all converted into oil and is not now exported as an oilseed. A very satisfactory sunflower-seed crop of around 1,000,000 tons is expected. The current Argentine maize crop is privately estimated at 7,000,000 metric tons, compared with 5,815,000 tons harvested last year, but no reports are yet available as to the quality of the grain. The National Economic Council has resolved to recommend the Government to fix the basic price for this year's maize crop at 14 pesos per 100 kilos for both internal and export markets. Last year the basic price was fixed at 10 pesos per 100 kilos bagged and delivered on wagon at dockside in Buenos Aires but, with concessions subsequently made, growers received the equivalent of about 12 pesos per 100 kilos. The Argentine Rural Society has supported the appeal for a better return, and has expressed the opinion that the unremunerative price paid to farmers for their maize last season led to a serious decline in sowings. Foreign buyers have been showing more interest in Argentine maize than in wheat, and many markets—including the United Kingdom and neighbouring South American countries—are in fact showing unwillingness to pay the high prices asked by Argentine for wheat. European importers are also unable to pay the high prices quoted by the *Instituto Argentino de Promocion del Intercambio* for vegetable oils, but it is understood that they are buying oil-cakes and other residues freely in Argentina."

A message from Santiago de Chile says that although final official figures of this year's crops in Chile are not yet available, Press reports of the probable output are of an encouraging nature. The wheat crop is expected to yield 1,103,593 metric tons (against 902,562 tons last year) ;

barley 111,061 tons (98,878); and oats, 83,443 tons (67,365). There is said to be a glut of potatoes and efforts are being made to export 100,000 sacks to neighbouring Republics. It is hoped that production of rice will reach 99,631 metric tons, hemp fibre 5710 tons and hemp seed 4678 tons.

There has been adequate rainfall throughout Uruguay, and the condition of pasture is said to be good. *London Corn Circ.* May, 1948.—G.M.H.

Argentine Republic

Plant Pests and Diseases 1425

An intensive plan of action for the control of plant pests and diseases has been organized recently, the whole of the Argentine territory being provided with centres of attack. The direction of the work is in the hands of Engineer J. B. Marchionatto, who outlines and maps the organization in *Rev. argent. Agron.* June, 1948.—G.M.R.

Botanical Congress 1426

The Second South American Botanical Congress is to take place at Tucumán in October 1948, the Miguel Lillo Institute of that city being responsible for all arrangements. Discussions will be grouped in eleven sections, two of which deal respectively with applied (including agricultural) botany and with plant ecology and geography. Further information may be obtained from Dr. H. Descoles, Director of the Miguel Lillo Institute, Tucumán, Argentine Republic. *Rev. argent. Agron.* June, 1948.—G.M.R.

Uruguay

Research in Crop Husbandry 1427

The Institute at La Estanzuela has been called the "Svalöf" and also the "Rothamsted" of Uruguay, and in spite of its greater youth (it can count only 36 years of uninterrupted activity as against Svalöf's 60 and Rothamsted's 100) there is justice in the double description; for both plant breeding and general agricultural research are conducted at La Estanzuela, and at the same time the Institute is responsible for the production, supervision and distribution of pedigree seed. It is financed by the State and disposes of a total staff of 150 persons, an area of 3000 acres of land, and administrative offices, laboratories, storehouses, etc. occupying a group of sixty buildings. The influence of the Institute extends considerably beyond the borders of its own country and its pedigree strains are highly valued in South America. A short account of the Institute's history and work is presented by its Director and founder, Dr. A. Boerger, in *Ciencia Invest., Buenos Aires.* June, 1948.—G.M.R.

Venezuela

National Institute of Agriculture 1428

The journal of the Venezuelan Ministry of Agriculture for December, 1947, is largely concerned with the agriculture and industry of the fertile and progressive State of Aragua. It is in the vicinity of Maracay, the State's capital, that the National Institute of Agriculture is in course of establishment. All agricultural research and experimental work will be centred at this Institute, and an interim report is given on the work of the Departments of Agronomy, Soils, Entomology, and Genetics, which are already in existence. The activities of the Department of Agronomy include the production and distribution of seed, the propagation of seed of *Sesamum indicum* and of new Venezuelan bred strains of maize, trials of oil plants and of the mechanization of groundnut cultivation. The Department of Genetics is occupied with the breeding of oil plants, cereals, roots and tubers, beans, and cotton. Two new varieties of sesame, an oil plant eminently adapted to Venezuelan conditions, have been produced (Venezuela 51 and Venezuela 52), and two of maize (Venezuela 1 and Venezuela 3), while two other varieties of maize (Sicarigua and Reventón) are approaching completion and may possibly be released within a year or two. Important studies of sorghums and rice are in progress. *Agric. venez.* December, 1947.—G.M.R.

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LIST OF ABBREVIATIONS USED IN INDEX OF CROPS

Abbreviation	Heading
Adapt.	Adaptation
Agro-ecol.	Agro-ecology
Agron.	Agronomy
Anat.	Anatomy
Biochem.	Biochemistry
Bot.	Botany
Breed.	Breeding
Chem. comp.	Chemical composition
Compet.	Competition
Crop geog.	Crop geography
Crop prod.	Crop production
Crop rotat.	Crop rotation
Cultiv.	Cultivation
Cytol.	Cytology
Disease contr.	Disease control
Disease incid.	Disease incidence
Disease resist.	Disease resistance
Disease suscept.	Disease susceptibility
Disease sympt.	Disease symptoms
Drought resist.	Drought resistance
Ecol.	Ecology
Econ.	Economics
Embryol.	Embryology
Environ.	Environment
Ferts.	Fertilizers
Fmg syst.	Farming systems
Fodder conserv.	Fodder conservation
Fodder prod.	Fodder production
Fungic.	Fungicide
Genet.	Genetics
Germ.	Germination
Grain dry.	Grain drying
Graz.	Grazing
Harvest.	Harvesting
Herbic.	Herbicide
Histol.	Histology
Hybrid.	Hybrids or Hybridization
Inocul.	Inoculation
Insectic.	Insecticide
Irrig.	Irrigation
Land util.	Land utilization
Mech.	Mechanization
Metab.	Metabolism
Moisture cont.	Moisture content
Morphol.	Morphology
Nodul.	Nodules
Nutr.	Nutrition

Abbreviation	Heading
Nutr. val.	Nutritive value
Paras. host.	Parasite host
Pest contr.	Pest control
Pest resist.	Pest resistance
Photoperiod.	Photoperiodism
Photosynth.	Photosynthesis
Physiol.	Physiology
Phytogeogr.	Phytogeography
Plant introd.	Plant introduction
Pollin.	Pollination
Salt tol.	Salt tolerance
Sand bind.	Sand binding
Seed adult.	Seed adulteration
Seed cert.	Seed certification
Seed decort.	Seed decortication
Seed defect.	Seed defective
Seed disinfect.	Seed disinfection
Seed distrib.	Seed distribution
Seed dry.	Seed drying
Seed hard.	Seed hard
Seed(s) mixt.	Seed(s) mixture
Seed pellet.	Seed pelleted
Seed prod.	Seed production
Seed qual.	Seed quality
Seed regul.	Seed regulation
Seed segment.	Seed segmented
Seed select.	Seed selection
Seed sow.	Seed sowing
Seed stor.	Seed storage
Seed test.	Seed testing
Seed treat.	Seed treatment
Seed viabil.	Seed viability
Seed vital.	Seed vitality
Soil conserv.	Soil conservation
Spray.	Spraying
System.	Systematics
Taxon.	Taxonomy
Technol.	Technology
Toxic.	Toxicity
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